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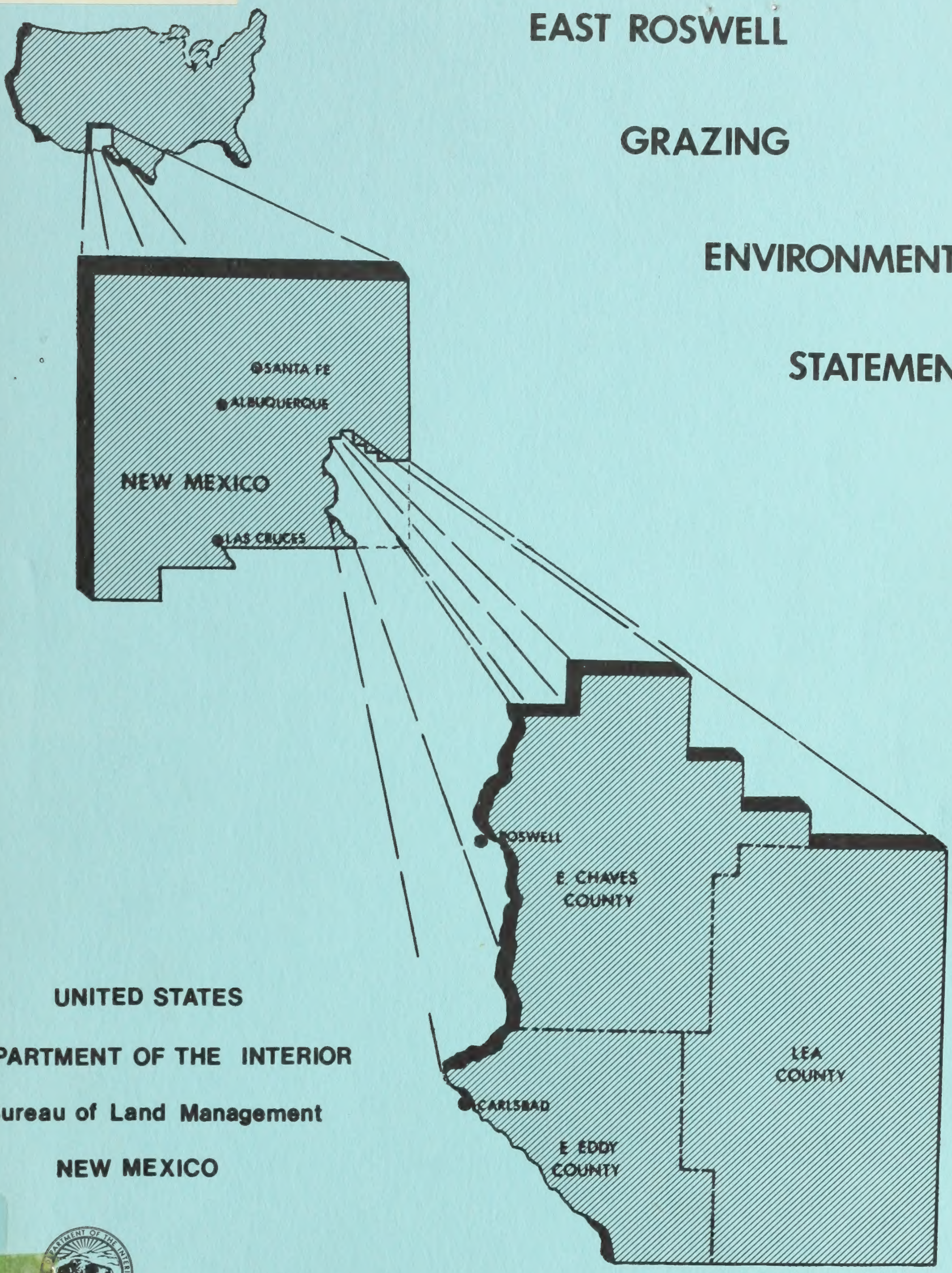

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DEPARTMENT OF THE INTERIOR

FINAL

ENVIRONMENTAL STATEMENT

ON

GRAZING MANAGEMENT

IN THE

EAST ROSWELL ES AREA

PREPARED BY

BUREAU OF LAND MANAGEMENT
DEPARTMENT OF THE INTERIOR

Ed Hastey
DIRECTOR, BUREAU OF LAND MANAGEMENT

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SUMMARY

Draft ( ) Final (x) Environmental Statement

U. S. Department of the Interior, Bureau of Land Management, Roswell District, New Mexico

1. Type of Action: Administrative (x) Legislative ( )

2. Brief Description of Action: Beginning in 1980 and continuing throughout an 8-year period, the Bureau of Land Management proposes to implement a livestock grazing management program for the east Roswell area (approximately 1,595,000 acres of the public land) in the Roswell District which is located in southeastern New Mexico. The overall objective of the proposed action is to improve range vegetative conditions and to provide a continuing supply of forage for livestock, consistent with the principles of multiple-use management. This proposal would: exclude approximately 6,600 acres from livestock grazing; initially allocate 168,111 animal unit months (AUMs) of forage to livestock and 2,893 AUMs to big game animals, expanding to an anticipated allocation of 367,442 AUMs of forage to livestock and 3,114 AUMs for big game, by the year 2000; set a maximum forage utilization-level of 40 to 60 percent (moderate); specify the development of grazing management systems based upon the physiological requirements of forage plants and the multiple resource values on 90 allotments and the revision of grazing systems on 20 allotments (containing a total of approximately 1,513,000 acres of the public lands); treat approximately 54,300 acres of the public lands initially with chemicals to control brush, expanding this acreage to a total of 961,000 over a period of 20 years; use mechanical means to remove brush from 440 acres; burn approximately 520 acres of tobosa/sacaton grasslands to stimulate growth and to improve the palatability of these grass plants; specify those livestock facilities which are necessary to implement specific grazing management systems, including 203 miles of fences and 246 watering devices. To accomplish the proposed action, livestock grazing would need to be adjusted to the present level of forage production as an initial requirement.

   Seventy-four allotments (involving approximately 76,800 acres of public land or 5 percent of the area) would be administered without grazing management systems being specified, but BLM would make those stipulations which are necessary to prevent deterioration of public land resources. Twelve areas which are unallotted would be managed exclusive of livestock and would remain unallotted.

3. Summary of Environmental Impacts: The net effect of the proposed action on the environment would be a general increase in productivity. Implementation of specific grazing management systems and/or of brush control programs on approximately 961,000 acres of public lands would result in an increase in vegetative production from approximately 175,000 AUMs to approximately 371,700 AUMs, a 112 percent increase by the year 2000. Range condition on areas without either brush control or specific grazing management programs (74 allotments containing approximately 76,800 acres of public land) would remain unchanged or gradually decline as brush density increases. Ground cover would increase over most of the area. As a result, soil losses would decrease from the present 1,037 acre feet to 809 acre feet by the year 2000, a 22 percent decrease. Wildlife habitat would be improved on 264,000 acres of shortgrass, 200,000 acres of short and midgrass, and 160,000 acres of dropseed-bluestem grassland for many birds, small mammals, and antelope. Some reptiles, shrubland birds, rabbits, bobcats, coyotes, and mule deer would not benefit from the proposal on these areas. Exclusion of livestock from 6,600 acres would benefit white-tailed deer, many birds, and some aquatic animals. Damage to cultural resources from erosion would be reduced, but trampling of sites by livestock could continue to occur. Additional access required for construction and maintenance of range facilities would contribute to increased vandalism of sites. Recreational opportunities for big game and most small game hunting would improve. Off-road vehicle activity would be somewhat hindered by the construction of approximately 203 miles of additional fence. Overall, recreational visitor days would increase from 1,700 to 2,741.

   Increased stocking rates between 1984 and 1989 would have positive social and economic effects on the ES area and the economy of southeastern New Mexico. However, adjustments in permitted levels of grazing between 1980 and 1984 would have temporary negative social and economic effects. Between 1981 and 1984 livestock sales from ranches in the study area would decline by $1.5 million from 1978 levels. This decrease in ranch income in the 1980's would represent less than 0.2 percent of total personal income in Chaves, Eddy and Lea Counties. Indirect impacts on employment and income would also be minimal with approximately 60 jobs displaced in 1983, or less than 0.1 percent of projected employment. In addition to the estimated, 38 operators presently holding off-ranch employment, 15 operators may have to obtain such employment to supplement their ranch income and 8 to 10 ranch workers may have to be laid off. Ranch wealth-capital position would have also dropped by $8.5 million, limiting the ability of ranchers to borrow against collateral.

   As range improvements begin to affect forage production in 1984, economic conditions for ranch operators in the ES area would improve. Ranch operations would be more profitable, and the 15 ranchers who took off-ranch jobs in the 1980's would no longer need to hold them and an additional 4 to 5 operators would be able to leave such jobs. The estimated 8-10 ranch worker jobs lost between 1981 and 1984 would be regained along with an additional two jobs. Related jobs in other economic sectors would also be restored and increased. Financing problems for most ranchers would be alleviated by increased income and gains in ranch wealth-capital position. These improvements in economic condition would continue to occur through the year 2000. Levels achieved by that date are expected to be maintained thereafter.

   Between 1984 and 2000, the proposed grazing management program would itself entail expenditure in the region of between $350,000 and $700,000 annually. The economic stimulus of this spending during this period would offset any regional economic impact from allotment reductions.

4. Alternatives Considered:

   a. Proposed Action Using Alternative Chemicals

   b. Proposed Action With Mechanical Brush Control Only

   c. No Action

   d. Livestock Maximization

   e. Livestock Adjustment

   f. Enhancement of Other Resource Values

   g. No Grazing

5. Comments have been Requested from the Following: See attachment.

6. Date Statement Made Available to EPA and the Public

   Draft Statement: June 15, 1979

   Final Statement: SEP 27 1979

ERRATA SHEET

VISUALS

Visual A - Land Status: Section 16, T. 6 S., R. 27 E. is shown as private land. It should be shown as state land.

Visual C-2 - Range Improvement Projects: Areas indicated as proposed exclosures in allotments 5020, 5023, 5024, 5025, 5036, 5040, 5082, and 5088 are in error. They should indicate areas where wildlife waters may need to be developed.

Visual D - Range Sites: Active dunelands, badlands, waste, and riparian are land forms rather than range sites.

Visual E - Vegetative aspects: Javelina should be javelina bush. Sarcaton should be sacaton.

Table A-2 - Corrections of minor errors identified in acreages contained on Table A-2 have not been made. However, these corrections would be made prior to issuing specific decisions.

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CHAPTER 1

DESCRIPTION OF THE PROPOSED ACTION

Chapter 1

DESCRIPTION OF THE PROPOSAL

PROPOSED ACTION

In this environmental statement (ES) the Bureau of Land Management's (BLM) Roswell District is proposing a grazing management program for an area located in southeastern New Mexico, including those portions of Chaves and Eddy Counties which are located east of the Pecos River, and all of Lea County. The major towns in or near this area are Roswell, Artesia, Carlsbad, Hobbs, and Lovington. For purposes of this document, this area will be referred to as the East Roswell Grazing Environmental Statement Area, or as the ES area.

There are approximately 4,739,400 acres included within the ES area. Lands administered by the BLM (referred to in this document as "public lands") cover 1,595,695 of these acres. State, private, and other federal lands which are not administered by the BLM occupy the other 3,143,705 acres. Of those, 842,924 acres are intermingled with the public lands and are indirectly involved with the proposed action. The other 2,300,781 acres are included in the geographic boundaries of this ES area because small, scattered parcels of the public lands occur among them. This statement will discuss these other 2,300,781 acres of state, private, and other federal lands as appropriate. However, for the most part, these lands are not involved. Visual A indicates type of land ownership.

The program proposed by the BLM, as described in this environmental statement, is the result of the Bureau's planning system process as it relates to livestock grazing within the eastern portion of the Roswell District.

This statement is based on Step 2 of the Management Framework Plan (MFP). At this point, various resource recommendations are compared and interrelationships between these recommendations and of the values derived from various economic, social, institutional, and environmental considerations are analyzed and considered. Competing recommendations are reconciled and/or coordinated, a multiple-use proposal is prepared, and alternatives are identified. Step 3 decisions will be made following completion of the ES. Those proposals and alternatives relating to livestock grazing form the basis of this statement and are summarized and displayed on Table A-1 in Appendix 1. Included on this table are the basic recommendations which allocate forage and identify the intensity of management together with and the land treatments and facilities proposed. In addition, any conflicting recommendations or values; an analysis of the conflicts; the multiple-use proposal; and identification of the resource tradeoff are included. Detailed visuals of the multiple-use proposals relating to livestock grazing are included in the pocket of the back cover. Technical terms are defined in the glossary.

PURPOSE AND OBJECTIVE

The purpose of the proposed action described in this ES is to attain those objectives of the planning system which have been identified as being attainable through a grazing management program. The general objective is to administer livestock grazing on the public lands within this ES area in a manner which would protect those lands and their resources. Specific objectives to be met by the proposed action are to provide a stable base over the long-run (defined as the 20-year period expected to begin in October, 1979) for the ES area's livestock industry (which is dependent on the public lands). These objectives would provide for the improvement, development, and rehabilitation of the public lands for the benefit of livestock grazing over the long-run, consistent with environmental and economic constraints and with the concepts of multiple-use and sustained yield.

For BLM's wildlife program, these objectives are to provide forage for big game populations on a basis which is proportional to that percentage of the public lands occupied. BLM's objectives are also to provide for livestock exclusion areas to meet habitat requirements for lesser prairie chicken, islands of maximum vegetative cover for other wildlife species, and areas for continuing vegetative studies over the long-run.

In addition, the objectives are to provide for the physiological requirements of forage plants, while continuing to authorize livestock grazing and to improve the rangeland vegetative resources until the potential production for each range site has been reached.

DESCRIPTION OF THE PROPOSED ACTION

The multiple-use proposals relating to livestock grazing developed in Step 2 of the MFPs for this ES area are the basis for this environmental statement's proposed action (see Appendix 1, Table A-1). These proposals reaffirm the continuation of livestock grazing on public land areas where it is presently authorized (approximately 1,590,000 acres) and also identify areas where grazing is not now authorized and would not be in the future (approximately 5,561 acres). The proposals reaffirm the classification for kind of livestock and period of use (yearlong) and designate areas to be excluded from livestock grazing (approximately 7,000 acres). They also allocate the forage resource between livestock (approximately 168,111 AUMs) and big game (approximately 2,893 AUMs); establish a maximum level of range utilization at 40 to 60 percent (moderate use), and a minimum level for livestock management and specify a minimum rest requirement. These proposals also direct the development of range improvement projects. (For a discussion of proper range utilization, see Appendix 1.)

Grazing Management

Livestock grazing would continue to be authorized on all 184 of the ES area's existing allotments (approximately 1,590,000 acres of public land). There would be no action taken by BLM to consolidate or separate grazing allotments. The 12 parcels of public lands (5,561 acres) not presently allotted for livestock grazing would remain unallotted. Table A-2 in Appendix 1 shows acreages by ownership type for each allotment. This table also indicates the number of public land acres contained in each of the twelve unallotted parcels. Table 1-1 summarizes acreages by ownership type and by management category. Visual B indicates the management categories proposed in the ES area.

TABLE 1-1
SUMMARIZATION OF APPENDIX TABLE A-2 SHOWING ACREAGES BY TYPE OF OWNERSHIP FOR EACH MANAGEMENT CATEGORY

Management Category	No. of Allot- ments	Total Acreage	State and Private Acreage	Other Federal Acreage	Public Land (BLM) Acreage
Specific Grazing Systems (to be revised)	20	877,528	294,572	0	582,956
Specific Grazing Systems (to be developed)	90	1,398,195	461,996	5,843	930,356
No Specific Grazing Systems	74	76,822	Not Known[1]	Not Known	76,822
Unallotted Parcels	12	5,561	N. A.	N. A.	5,561
Total	196[2]	2,358,106	756,568 [1](plus 80,513)	5,843	1,595,695

[1] Acreages of private and state lands used in conjunction with the scattered tracts of public lands are not known for all ranch operations within this category. However, approximately 80,513 acres of private and state lands in this category would be indirectly affected by actions on the public lands.

[2] Includes unallotted parcels.

N. A. Not applicable to this category.

The ES area's lands are presently classified as being suitable for grazing by cattle, sheep, goats, and/or horses. This classification would remain unchanged. The present grazing use of the public lands is primarily by cattle with some use authorized for domestic horses. Change from this present kind of use is not anticipated. However, should requests be received for changes in kind of livestock, they would be processed, based on the merits of each individual situation, and on the results of an Environmental Assessment Report (EAR).

All allotments in the area are classified as being suitable for grazing yearlong and are presently authorized for such use. This classification and authorization would remain unchanged.

There are approximately 175,167 AUMs (67,439 tons) of forage being produced on the ES area's public lands at the present time (this represents less than one half of the ES area's total vegetative production). The amount of forage being produced was determined by the 1977-78 range survey. (The methodology used to conduct this survey and to determine present forage production plus procedures used to determine suitability of the range for grazing livestock, methods for estimating future forage production, and the procedures used for allocating forage, is discussed in Appendix 1.)

Of these 175,167 AUMs of forage, approximately 168,111 would initially be allocated to livestock use (Table 1-2 summarizes allocations by management category). This allocation to livestock would be a reduction of approximately 65,774 AUMs from the present licensed use (233,885 AUMs). (Table A-3 in Appendix 1 shows how each allotment would be affected.)

TABLE 1-2
INITIAL ALLOCATION OF FORAGE BY MANAGEMENT CATEGORY
IN COMPARISON WITH PRESENT USE
(Source: Appendix Table A-3)

Management Category	Present Licensed Use (AUMs)[a]	Present Production (AUMs)[b]	Production On Excluded Lands[c]	Big Game Allocation (AUMs)	Livestock Allocation (AUMs)	Residual (AUMs)[d]
Specific Grazing Systems (to be revised - 20)	74,652	64,313	265	881	62,119	1,048
Specific Grazing Systems (to be developed - 90)	143,747	102,170	540	1,827	97,573	2,230
No Specific Grazing Systems (73)	15,486	8,684	65	185	8,419	15
Unallotted Parcels (12)	0	0	0	0	0	0
Total	233,885	175,167	870	2,893	168,111	3,293

a. Present licensed use and actual use are considered to be approximately equal, although any specific operation during a particular year may vary from this amount to a small degree.

b. Present production, as identified on this table, is forage production and represented less than one half of the total vegetation that is being produced.

c. Excluded lands refer to those lands that are being proposed for exclusion from grazing because of other resource considerations (nesting habitat and vegetative studies).

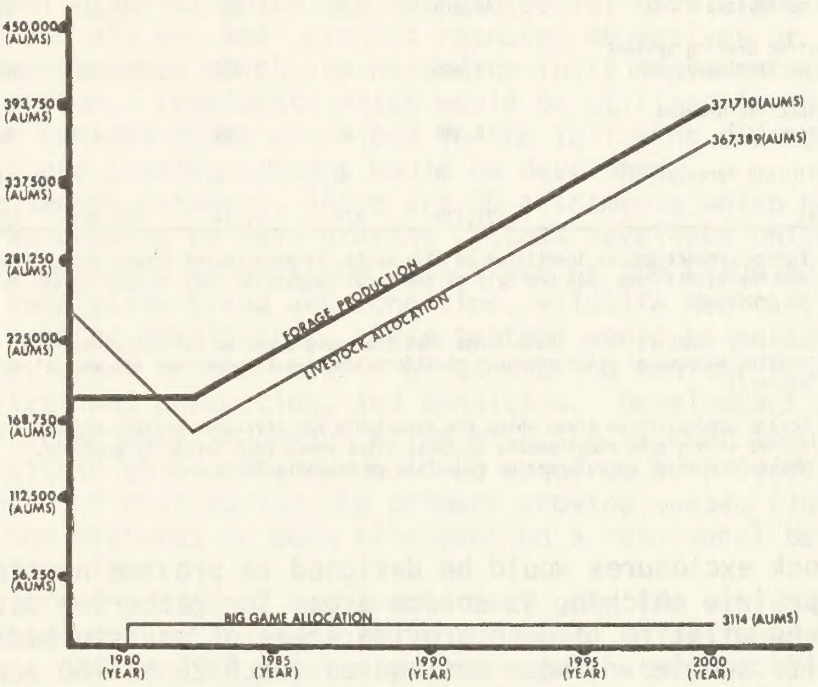
d. Forage production on areas which are unsuitable for livestock grazing and in excess of big game requirements on those sites where such forage is produced. Values are based on information contained on Appendix Table A-3.

Allocations to livestock and big game would be expected to change as forage production changes. See Graph 1-1 for a display of the anticipated allocation of the forage production over a period of time. Monitoring would begin with implementation and changes in allocation would be made as forage increases. It is anticipated that, by the year 2000, adequate forage would be produced to provide for an allocation of approximately 367,389 AUMs to livestock. This would be an increase of approximately 199,278 AUMs over the initial allocation. (Table 1-3 summarizes anticipated future allocations by management category and Table A-4 in Appendix 1 shows how each allotment would be affected.)

GRAPH 1-1

ALLOCATION OF FORAGE OVER A 20 YEAR TIME PERIOD.

WITH THE PROPOSED ACTION



Approximately 2,893 AUMs of forage would be initially allocated to meet the needs of big game animals. Allocations for wildlife would change in proportion to changes in big game populations, based on the amount of forage required to meet their needs (projected increases in big game populations within the next 20 years would result in a requirement for approximately 3,114 AUMs by the year 2000, an increase of 221 AUMs). There are approximately 5,560 acres of public lands which are unallotted for livestock grazing and the forage production on these parcels is unknown. There are 6,565 acres of proposed livestock exclosures and all forage on those public land acres as well as that on the public lands which are unsuitable for livestock grazing would be available for big game use. However, approximately 4,163 AUMs of forage are being produced on these areas in excess of the amount needed by the big game occupying those sites. Forage and vegetative production which are surplus to big game grazing requirements would be available for use as additional cover for other wildlife species, watershed protection, and enhancement of esthetic values.

TABLE 1-3
ALLOCATION OF FORAGE BY MANAGEMENT CATEGORY (LONG-RUN, BY THE YEAR 2000)
(Source: Appendix Table A-4)

Management Category	Future Production (AUMs)[a]	Production On Excluded Lands[b]	Big Game Allotcation (AUMs)	Livestock Allocation (AUMs)	Residual (AUMs)[c]
Specific Grazing Systems (to be revised - 20)	143,078	265	927	141,872	14
Specific Grazing Systems (to be developed - 90)	219,948	540	2,002	217,098	308
No Specific Grazing Systems (73)	8,684	65	185	8,419	15
Unallotted Parcels (12)	0	0	0	0	0
Total	371,710	870	3,114	367,389	337

a. Future production, as identified on this table, is anticipated forage production and represents less than one half of the total vegetation that is anticipated to be produced.

b. Excluded lands refer to those lands that are being proposed for exclusion from grazing because of other resource considerations (nesting habitat and vegetative studies).

c. Forage production on areas which are unsuitable for livestock grazing and in excess of big game requirements on those sites where such forage is produced. Values are based on information contained on Appendix Table A-4.

Livestock exclosures would be designed to provide nesting habitat for lesser prairie chicken, as source areas for gathering data concerning vegetation and wildlife, and to provide areas of undisturbed habitat for other wildlife species. These exclosures (each 20 to 160 acres in size) would total 6,565 acres of public lands. In Appendix 1, Table A-3 shows present AUMs of forage that would be reserved by the exclosures and Table A-4 shows anticipated future AUMs of forage that would be reserved. Table A-5 lists specific acreages to be excluded on each allotment and Table A-6 presents a legal description of areas in which exclosures would be located.

There are four proposed management level categories into which the 184 allotments and the 12 unallotted parcels within the East Roswell ES Area have been divided. The categories are based on the amount and configuration of the public lands and the resource values involved. These are: allotments with existing "specific grazing" systems which need to be revised; allotments for which specific grazing systems would need to be developed; allotments where the amount of public lands involved, other resource values, and environmental considerations indicate that development of specific grazing systems would not be necessary for the protection of public land resources; and unallotted areas where livestock grazing would not occur.

There are 20 allotments in the first category which have specific grazing systems in effect. These systems would be examined to see if they are meeting objectives of the planning system, e.g.: to meet the physiological requirements of forage plants, wildlife habitat needs, and livestock production goals. These grazing systems would be revised or adjusted, as necessary, based on the results of studies monitoring forage utilization, vegetative trend, and vegetative condition. Revisions would be made in consultation with the ranchers involved. "Specific grazing management" treatments selected for incorporation would be based on the dominant forage species present on each allotment. Observations by BLM specialists indicate that "specific grazing management" systems in the Roswell District which are not successful have either been overstocked and did not meet present resource objectives or they lack the range improvements which are needed to fully implement the grazing management system. Treatments which would be utilized in the revision would be the same as those described in the following discussion concerning allotments where grazing systems would be developed.

In the second category, there are 90 allotments which have been identified as needing to have grazing systems developed which would be specifically designed to meet the objectives of the planning system concerning vegetative trend and condition, wildlife habitat, and livestock production. After development, these systems would be revised or adjusted as necessary, based on the results of studies to monitor vegetative trend, utilization, production, and condition. Development and revisions would occur only in consultation with the rancher involved. Allotments within this category would be required to provide a minimum of four months of rest during the primary growing season (July - October) on each of the pastures in each allotment on a rotational basis at least one year out of four.

This minimum period of rest would meet only the very basic physiological requirements of forage plants but would be designed to provide time for some recovery of plant vigor through the production and retention of foliage necessary for the production of carbohydrates required to sustain the plants through winter or other dormant seasons. On areas with moderate to low densities of fourwing saltbush occurring in grassland areas, rest during the growing season appears to be essential, one in every three or four years, to maintain the populations (Pieper, et al., 1978.)

Requirements for rest in excess of this minimum period of four months would be based on the needs of individual plant species and on range conditions within individual allotments. Acreages and locations are presently unknown and would be identified during the development of specific grazing systems. Generally, in areas where vegetation is in poor condition and where the reproduction rates of plants are low, there would be a greater need for rest from grazing than there would be on allotments where vegetation is in good condition.

Allotments having important wildlife habitat components would be expected to need either more rest or a different timing of their rest periods than would allotments without such components. However, even the most stringent rest requirement proposed for this ES area would not exceed two years' rest out of every four on any one allotment. Normally, periods of rest would be administered on a rotational basis so that some pastures are grazed while others are rested.

There are five rest treatments which would be utilized in the revision or development of specific grazing systems for allotments in this ES area. They are: 1. A minimum of four months' rest (July through October) one year out of every four, 2. Eight months' rest (March through October) one year out of every four, 3. Sixteen consecutive months of rest (beginning with July) during every four-year period, 4. Rest for 20 consecutive months (beginning in March) within a four-year period, and 5. Rest for two consecutive years out of every four. The development of these treatments is based on specific vegetative and wildlife habitat requirements. A typical schematic for each of the proposed rest treatments is in Appendix 1, Schematic A-1.

The first of these five treatments would provide for a four-month period of rest during the ES area's primary growing season (July through October). Normally, pastures would be rested on a rotational basis. However, periods of rest would be dependent on the size of the allotment and the availability of forage on private lands which would allow an allottee enough flexibility in his grazing schedules to make annual deferments possible ("on-off" use or best pasture system: Herbal, Steigal, and Gould 1974). The four-month rest treatment is proposed to give forage plants an opportunity to periodically regain vigor. Use of this treatment would be limited to small allotments which are in excellent condition, without critical wildlife or other resource values which would be impacted by livestock grazing. Usually this treatment would only be applied on range sites having tobosa or sacaton grasses as the dominant species. Approximately 39,000 acres of the ES area's public land would potentially support these plants as dominant species and, therefore, be suitable for this minimum rest treatment.

The second method of treatment provides for eight months of rest over an entire growing season (March through October). Such rest would also be administered on a rotational basis, except for areas where an "on-off" situation would be practical. Under this method of treatment, rest would begin in early spring and would be planned to allow forage plants to start growing, regain vigor, and produce seeds. During years with adequate spring and summer moisture (about 1 out of every 5 years), two complete growing cycles would be completed on some plants such as sand dropseed, threeawns, and the gramas each year. This is a phenomenon which is sometimes observed in this ES area. When such a double growing cycle does occur, there would be an opportunity for new seedlings to become established. These eight months of rest are proposed to help preserve habitat for wildlife by providing spring rest on areas which produce large numbers of forbs. These forbs are an important portion of the forage resource and are an essential source of spring forage for antelope. Shrubs such as range ratany would also benefit from these rest periods.

On areas utilizing a two-pasture system, spring rest would be provided on 50 percent of the allotment annually. However, this eight-months' rest treatment would be limited to areas where the majority of plants are in a state of high vigor. Eight-month rest periods, as a treatment, would be applicable to approximately 875,000 acres of the ES area's public lands, specifically those allotments comprised primarily of range sites with sacaton, tobosa, and sand dropseed as the dominant species.

The third rest treatment method would provide rest from grazing for sixteen consecutive months. Pastures would be rested for a full year to allow forage plants an opportunity to regain vigor, produce seeds, initiate stolons, and to maintain these new stolons through the winter and early spring months. The additional four months of rest during the next growing season would allow seedlings to become established. Litter would be given an opportunity to accumulate during this extended rest (Hormay 1970).

Rest periods of sixteen consecutive months would be proposed on areas where black grama and other stolon-producing plants are dominant or where cool-season species, such as New Mexico feathergrass and needle and thread grass, have been depleted. Extended rest periods would also be used where such key species as black grama, plains bristlegrass, and hooded windmill grass need a chance to improve their vigor. Extended rest would also be considered in areas where wildlife habitat requirements call for periodic exclusion of livestock during the spring (March through June) and where desirable woody plants, primarily range ratany and fourwing saltbush, make up a portion of the forage resource. On areas utilizing a two-pasture system, 50 percent of the area would be rested during spring each time rest occurs.

This sixteen-month period of extended rest is designed to allow desirable woody plants sufficient rest to complete their reproductive cycle and to improve their vigor. Plants such as black grama, which spread by stolons from the parent to create new plants, would be afforded an opportunity to complete yearlong reproductive cycles. Stolons would be produced during the first growing season and would be left undisturbed through the following winter. With the return of another growing season, these stolons would be allowed to take root and to become firmly established before they would be exposed to grazing pressure. This same rest period would be expected to allow cool-season species an opportunity to grow and produce seeds. On areas where plant vigor is low, periods of rest from grazing would be planned to allow the key species an opportunity to produce and store food, thus improving the general health (vigor) of these plants. The use of an extended (sixteen-month) rest period would be a suitable method of treatment on approximately 1,404,000 acres of public lands in the ES area.

The fourth treatment proposes a grazing rest period of twenty months which is designed to accomplish the same objectives as those of the sixteen-month rest period. In addition, this treatment would provide an extra period of spring rest for gains in forage plant vigor and it would also provide areas with forbs for antelope use, exclusive of livestock competition. This rest treatment would be suitable for use on all 1,404,000 acres of public lands identified as needing to have specific grazing systems revised or developed.

The fifth rest treatment identified would designate a two-year period of rest from grazing designed to accomplish the same goals as the twenty-month treatment. However, there would be a second winter rest period to provide additional protection for desirable woody plants such as range ratany and for stolon-producing plants such as black grama. This treatment would be suitable for use on all 1,404,000 acres of public lands where specific grazing treatments would be revised or developed.

As a minimum, at least 538,750 acres of the ES area's total of 1,595,695 acres would receive rest from grazing during the summer growing season of each year. Any given acreage within those allotments being proposed for the development of "specific grazing management" systems (1,516,000 acres) would receive rest during the growing season about one year out of every three. In addition, and also as a minimum, spring rest would occur on 407,000 of the ES area's 1,595,695 acres each year, with any given acre within allotments where development of "specific grazing management" systems is proposed (1,516,000 acres), receiving rest about one year out of every four.

The choice of a specific grazing treatment or combinations of such treatments to be used on an allotment would be based on the requirements of specific soils, vegetation, and other resource values involved. The development of a grazing system designed specifically for a particular allotment would be done in consultation with the affected rancher.

The third category, allotments where specific grazing systems are not required to protect the public lands resource, involves the remaining 74 allotments. These allotments would continue to be administered without requiring specific grazing systems because specific provisions to protect the public lands are not necessary at this time. However, these public lands would be monitored through studies designed to determine the degree of utilization and the direction of vegetative trends.

Evaluations would be made at five-year intervals to determine if specific provisions, such as establishing stocking levels or periods of use, would have become necessary to prevent damage to these public lands. Less than 10 percent of ranching on these 74 allotments is estimated to be on public lands and even this small amount is scattered. Specific management of these lands would not be practical but should such management become necessary to prevent damage to a critical resource, physical segregation of the public lands for control of livestock grazing would be possible. In many cases, ranchers have developed grazing systems of their own which are compatible with the vegetative needs of the rangelands and which would benefit these scattered tracts of the public lands as well. Often these systems are developed in cooperation with the Soil Conservation Service (SCS).

In the fourth category, there are twelve areas (5,561 acres) which are unallotted and which would continue to be administered without permitting livestock grazing. The majority of this acreage (approximately 5,000 acres) is not suitable for livestock grazing. Any unauthorized livestock use on these lands would be subject to trespass action. Table 1-4 summarizes rest treatments and the acreages to which these treatments would be applied.

TABLE 1-4
SUMMARY OF REST TREATMENTS AND THE ACREAGES TO WHICH THESE TREATMENTS WOULD POTENTIALLY BE APPLIED
(Source: SCS Soil Survey for Eddy, Lea, and Chaves Counties, range sites, BLM files)

Rest Treatment	Acres Having Potential For Treatment Application
Four Months' Rest	39,000
Eight Months' Rest	875,000
Sixteen Months' Rest	1,404,000
Twenty Months' Rest	1,404,000
Twenty-four Months' Rest	1,404,000
Yearlong Grazing	76,822
No Grazing	5,561

Note: This Table has not been totaled because many acres have the potential to receive several different treatments.

Range Improvements

There are two methods proposed for improving the rangelands: construction of facilities for supporting livestock production and treatments to increase the vegetative resources. Visual C-1 shows the extent and location of existing and proposed livestock facilities and Visual C-2 shows the areas where vegetative treatments are proposed. Appendix Table A-7 shows facilities and treatments, by allotment, which are discussed in the following sections of the ES. Summaries of Table A-7 are included in these discussions.

Vegetative Treatments

During the past 100 years, invasions of mesquite and creosote brush have reduced the amount of soil moisture which is available for the production of grass and forbs (Herbel 1965). Although both mesquite and creosote are native to southeastern New Mexico, these shrubs have drastically increased in abundance and distribution. Reductions in grass cover, severe droughts, and the rapid dispersal of mesquite seed through livestock droppings, are reasons for the rapid spread of mesquite within the ES area (Herbel 1965). Mesquite continues to increase wherever it becomes established, competing with perennial grasses. Creosote has also increased on areas where grass cover and vigor have been depleted, in the same manner as mesquite. These two shrubs now infest approximately one million acres which were formerly productive grasslands but where the grass cover has become depleted. Both are considered to be undesirable brush plants because of their invasion into previously brush-free grasslands.

From 1959 until 1971, efforts were made to control mesquite and creosote on 126,000 acres of the public lands in the Roswell District. These efforts were interrupted in order to evaluate the results achieved and to determine the effects of herbicides on the environment. The Roswell District's chief of operations from 1960 through 1969, Bill Leifeste, prepared a master's thesis in 1971, entitled "Control of Mesquite in Southeastern New Mexico," which was based on this spray program. While working as chief of operations, Leifeste monitored forage plant responses following brush control treatments. Table 1-5 summarizes a portion of his onsite data concerning yields of perennial grasses following treatments on ten locations in the ES area.

Control of brush species was accomplished using spray applications of phenoxy herbicides (2,4,5-T and Silvex which are now prohibited for use on the public lands by the Department of Interior) to the foliage of mesquite and creosote (foliar applications). Leifeste recorded changes in the production of perennial grasses following brush control treatments. Dramatic increases in the production of perennial grasses were documented wherever the canopy cover of mesquite was reduced to a level below 3 to 5 percent of an area's total ground cover. On allotment 6040 (Brininstool), the 1965 treatment killed 50 percent of a high-density mesquite stand.

Two years after treatment, production of perennial grasses on the sandy range site was approximately 463 pounds per acre, half of which would be properly usable by livestock. This would equal 3.3 acres per AUM. This production is roughly equivalent to the Soil Conservation Service (SCS) data for what that range site should achieve, if it is in excellent condition (3 ac/AUM).

In comparison, on the same range site and on the same allotment, areas which were not treated to control mesquite required 18 to 20 acres to produce an AUM of forage. Another striking feature of this brush control program is that benefits gained towards the production of forage during the 1960s have persisted through the late 1970s as demonstrated by the 1977-78 forage inventory.

Stocking at levels which could be supported by the amount of available forage and the implementation of strategic rest periods were also identified by Leifeste as being critical for successful plant recovery, following treatment to control brush.

TABLE 1-5
GRASS PRODUCTION ON ADJACENT SPRAYED AND UNSPRAYED AREAS AT THE CLOSE OF THREE GROWING SEASONS ON SEVEN SPRAY SITES
(Source: Leifeste 1971)

Allotment and Year of Treatment	% Brush Kill	PRODUCTION					
		1965		1966		1967	
		No. Obs	Perennial Grass lb/a X	No. Obs	Perennial Grass lb/a X	No. Obs	Perennial Grass lb/a X
Bates 1959							
Sprayed	38	14	1142*±162*	25	2056*±240*	25	2407*±252*
Unsprayed		14	688 ±186	25	1506 ±290	25	1724 ±290
Bates 1964							
Sprayed	2	14	408 ±124	25	304 ± 43	25	493 ± 98
Unsprayed		14	378 ± 99	25	335 ± 91	25	384 ± 65
James 1961							
Sprayed	46	17	239 ± 98	25	263 ± 78*	25	324 ±151*
Unsprayed		17	199 ± 77	25	122 ± 53	25	74 ± 24
Daniels 1962 & 1965							
Sprayed	48	15	472 ± 73	25	501 ± 63	8	249 ± 77*
Unsprayed		15	393 ± 53	33	397 ± 70	8	115 ± 46
Snyder 1963							
Sprayed	31	15	149 ± 48	25	230 ± 39	25	321 ± 96
Unsprayed		15	136 ± 68	25	153 ± 54	25	295 ± 92
Snyder 1966							
Sprayed	11			25	107 ± 33	25	209 ± 89
Unsprayed				25	118 ± 51	25	177 ± 49
Brininstool 1965							
Sprayed	50	16	69 ± 51	25	188*± 66*	25	463 ± 39*
Unsprayed		16	57 ± 62	25	71 ± 44	25	84 ± 38

* = significant value at the 95% level.
Obs = Observations

Based on this information, a program to control brush through the use of herbicides is proposed. This proposal is designed to initially treat 54,280 acres of rangelands which have been invaded by mesquite and creosote. Eight different range sites, on ten separate allotments having specific grazing systems in effect, would be treated (Table 1-6 shows acreages proposed for initial treatments, by range site within allotments). Revisions in grazing systems which are necessary to meet the multiple-use objectives as previously stated, would be completed prior to initiation of vegetative treatments in order to ensure that rest from grazing would be provided to meet the physiological requirements of perennial forage plants. The proposed action would utilize both dicamba and picloram in programs to control both mesquite and creosote.

Individually, both dicamba and picloram have been labeled and approved for rangeland use, but a tank-mix of these two chemicals, as is being proposed in this statement, has not yet been labeled. It is

TABLE 1-6
INITIAL ACRES OF PROPOSED CHEMICAL BRUSH CONTROL ON RANGE SITES WITHIN ALLOTMENTS
(Source: Roswell District Files)

Allotment		Range Sites								Totals
No.	Name	Deep Sand	Sandy	Bottom Land	Sand Hills	Gravelly	Loamy	Active Duneland	Limey	Allots.
Mesquite Spray										
6007	Caviness	1,940	800		710	60	40	50		3,600
6028	W. Brininstool	1,920								1,920
6037	Diamond & Half	4,728	624		192	1,720		680	96	8,040
6038	James	2,240	840		40			80		3,200
6039	Robbins	1,760	520					720		3,000
6040	C. Brininstool	3,200	195		280	60		915		4,650
7032	Sanders	4,930	370		1,050	20		870		7,240
7036	Madera	4,112	920	20	2,928					7,980
7040	Jackson	7,600			70					7,670
7042	Twin Wells	2,380	1,440	460	220					4,500
Total Spray		34,810	5,709	480	5,490	1,860	40	3,315	96	51,800
Mesquite Ground Granular 7040	Jackson		1,688	432						2,120
Creosote Aerial Granular 7040	Jackson		168			192				360
							Total Chemical Treatment			54,280

assumed that the tank-mix being proposed will be labeled and approved for rangeland use in the near future. The herbicide 2,4,5-T is already labeled for use and is an effective treatment for mesquite control; however, it is presently on the list of chemicals prohibited for use by the Department of Interior.

Knowledge gained from these initial treatments would be used in developing specific treatment programs for approximately 961,300 acres (see Table 1-7) which have also been identified for brush control treatments by the year 2000. BLM specialists anticipate that treatments to control brush on this remaining acreage would be similar to those applied to the initial 54,280 acres. Areas where mesquite plant densities are greater than 150-200 plants per acre would be treated by aerial applications of a combination of picloram, dicamba, and diesel fuel in water. These applications will be discussed in detail later in this chapter.

TABLE 1-7
ANTICIPATED BRUSH CONTROL PROGRAM WITH HERBICIDES
(Source: Roswell District Files)

Target Infestation	Treatment Method[a]	Herbicide	Formulation	Rate	Initial Treatment Acres	Total Treatment Acres	Expected % Kill	Estimated Chemical Re-treatment Within 30 Years (acres)[b]
Mesquite	Ground Individual Plant	Dicamba	Granules (5% active ingred.)	6 grams active ingred. per 16 sq. ft. of canopy	2,120	207,100	40%	124,260
	Aerial - Broadcast Application	Picloram + Dicamba (tank mix)	1:6 oil in water emulsion. Maxim. of 1 qt. diesel oil per acre.	1/4 lb. active ingred. Picloram + 1/4 lb. active ingred. Dicamba per acre. Total of 2 gal/acre solution.	51,800	648,380	40%	389,028
Creosote	Aerial - Broadcast Application	Picloram	Granules (10% active ingred.)	1 lb. active ingred./acre	360	105,884	50%	52,942
				Totals	54,280	961,364		566,230

[a] Ground applications would be on low density brush stands or for selective control within a desirable stand of susceptible species.
[b] Retreatment acreage may be considerably less depending on the rate of reinvasion.

Areas with similar densities of creosote brush would be treated with an aerial application of the granular form of picloram. Areas with mesquite densities of less than 150 plants per acre would be treated through ground applications of the granular form of dicamba. Table 1-7 indicates the method, herbicide, formulation, rate of application, and the total number of acres (initial and total) anticipated for treatment listed by target species.

Neither mesquite or creosote would be eradicated through the use of these chemical control techniques. Chemicals applied to the foliage (foliar applications) are considered to be successful if 30 percent of the target plants are dead when the project is evaluated 24 months after treatment. Ground applications of granular herbicides may kill 60 to 80 percent of the plants treated. In 1971, Leifeste reported that a 30 percent kill on heavy infestations of mesquite is sufficient to boost perennial grass production by 70 to 100 percent on such productive areas as the sandy range site. Grass production remains high for 7 to 30 years following treatment, depending on the rate of brush recovery. If the initial treatment is very successful, these areas may not need to be treated again for many years. However, because of the resistance of mesquite and creosote to control, some form of maintenance treatment is

TABLE 1-8

BRUSH CONTROL METHODS FOR MAINTENANCE TREATMENTS

(criteria developed from Herbel et al., 1973; Scifres, et al., 1973; and Fisher, et al., 1973)

Mechanical Grubbing

Brush density less than 150 to 200 plants per acre. Brush height greater than 30 inches tall in order to be seen by operator. Good seed sources available between plants to insure grass recovery. Soils only slightly susceptible to erosion (suitable range sites are: Sandy, salty bottomland, bottomland, loamy, salt flats). Can be conducted year-round whenever soils are slightly moist.

Hand Applied Herbicides

Brush density less than 100 to 150 plants per acre. Can be applied 30 to 60 days before or in early part of rainy season. Suitable on all range sites.

Vehicle Mounted Spraying

Brush density should be less than 150 to 200 plants per acre. Application should coincide with susceptible period of target species: mesquite - mid-May to mid-June, creosote - August through September. Terrain must be suitable for vehicle travel.

Aerially Applied Foliar Spray

Brush density 100 plants per acre or greater. Suitable for large acreages or areas inaccessible to vehicles or hand application operations. Application timed to coincide with susceptible period of target species.

Aerially Applied Granular Herbicides

Brush density 100 plants per acre or greater. Suitable for large acreages or areas inaccessible to vehicles or hand application operations. Applications can be applied 30 to 60 days before or during the susceptible period of target species.

Burning

Suitable only on areas with a heavy accumulation of combustible litter, dry grass, and dead brush. Standing dried forage must exceed 500 pounds per acre to carry a brush killing fire. (Probably range sites with this potential fuel load are: bottomland, salty bottomland.)

expected to be necessary within 10 to 20 years of the initial treatment. Table 1-8 identifies methods presently available for use. Herbicides which would be used include those identified in the proposed action; however, any new chemicals which are approved by the Department of Interior would be considered.

To extend the time until maintenance treatments become necessary, grazing management would be intensively regulated to insure recovery of perennial forage plants on treated areas. Grazing would not be permitted for 16 months (two growing seasons) following brush control treatments. Thereafter, specific grazing systems would be required which were designed to periodically provide rest from grazing to assure that the physiological requirements of the dominant forage species are met on each range site. Mesquite and creosote plants would be expected to eventually increase in numbers, even if grazing were not permitted (Herbel 1965). However, the density of these brush species may increase for several years with no detectable reduction in grass production, until a threshold density occurs. In 1971, Leifeste reported that, at a 3 percent mesquite canopy cover, significant reductions in grass production started to occur. Therefore, this may be the threshold. Forty-six percent of the variation in grass cover could be attributed to variations in the mesquite canopy cover. Because of variables such as climate, insects, and disease which affect forage production, these areas would not undergo retreatments or maintenance treatments until after watershed and vegetative conditions had been monitored for several years and an actual decline in production is apparent. Any method of treatment then recommended would be specified according to the condition of range sites, mesquite or creosote densities, and opportunities for treatment which may be available.

Specifics on the methods to be used during the initial application of herbicides and for anticipated subsequent applications are as follows.

1. Aerial applications of liquid herbicides would make use of fixed-wing aircraft with positive shutoff spray systems, special drift reduction nozzles and spray mix adjuvants to apply herbicides to the specific target areas. Aerial applications would be accomplished under a contract to be let through competitive bidding processes. These applications would take place between mid-May and the first of July.

2. Aerial applications of granular herbicides would also make use of fixed-wing aircraft with a positive shutoff application chute. All aerial dispersion would be accomplished by contractors. These herbicide applications would take place from mid-May through mid-September depending on target species (mesquite mid-May to July 1, creosote July 1 through mid-September).

3. Ground application of granular herbicides would be carried out by hand. With this method, granular herbicides would be placed on the ground over the root system of mesquite or creosote, as the applicator traverses the area on foot, horseback, or motor vehicle. Application would be accomplished by BLM employees under the Young Adult Conservation Corps (YACC) or Youth Conservation Corp (YCC) programs, regular BLM employees, or by contract labor during the early summer before rainfall is received. Transmittal of the herbicide through the plants' root system is dependent on rainfall because plants are most susceptible to the effects of the herbicide during periods of active growth.

In addition to the program of vegetative treatments with herbicides, the use of tractor-mounted root knives is proposed for selective control of mesquite in areas where habitat for the lesser prairie chicken is located. Two hundred and eighty acres of the public lands on allotment 5028 and 160 acres on allotment 5034 would be involved in this specific program. This acreage is covered by a low-density mesquite stand occurring on the Ratliff-Radona soil series. Treatment would occur in years with average or above rainfall and would take place after soil moisture is high (late July, August, or September). In the area proposed for treatment, good stands of grass exist between the mesquite plants.

Also, controlled burning is proposed for areas where old growths of alkali sacaton and tobosa grasses have accumulated reducing the palatability of these plants for grazing animals and also reducing plant productivity. Primary areas to be burned are approximately 520 acres on allotment 5051. There are other areas proposed for burning which are less than 100 acres each. These are scattered throughout the ES area. Because of the small areas involved, specific locations have not been identified in this document. Less than 2,000 acres would be treated by burning. Reburning is anticipated to be necessary every three to five years to maintain the desired condition.

The specific objectives of the brush control program are to:

1. Halt further rangeland deterioration resulting from the invasion of undesirable brush species.

2. Increase soil moisture available for growth of grasses and forbs, thus increasing total ground cover.

3. Prevent surface soil erosion from wind and water by increasing density and cover of perennial grasses.

4. Increase the food plants and organisms to provide a greater diversity of vegetation for wildlife.

5. Improve nesting and escape cover for a variety of grassland game and nongame birds.

6. Enhance the area for pronghorn antelope by reducing visual restrictions caused by dense brush.

7. Provide a better quality and quantity of vegetation for domestic livestock.

8. To facilitate specific livestock management programs as well as reduce maintenance costs on livestock management facilities.

Policies and laws that would be followed in the proposed brush control with herbicides program are:

1. Environmental impacts would be identified through an onsite environmental assessment report and measures taken to mitigate potentially adverse environmental impacts for each specific treatment location.

2. Programs would be reviewed with user groups, interested organizations and the general public.

3. Only federally registered pesticides would be used on public lands except as authorized by Section 24.c., Public Law 92-516, the Federal Environmental Pesticide Control Act of 1972. Section 24.c. provides for state registration of certain pesticides for local needs within the state. Any pesticide proposal planned under a state registration would include a copy of the state label.

4. Tank mixes of pesticides may be approved if: such mixture is provided for on one or more labels of EPA registered products; provided for under a state registration, or if the tank mix has been tested and has a written recommendation by an Agricultural Experiment Station or the State Department of Agriculture. The pesticides recommended in the mixture must be applied at a dosage rate not to exceed the label instructions for use of any single product for the same target pest and must not be specifically prohibited from mixing on either label. Each tank mix proposal must be accompanied by appropriate labels and/or a written recommendation.

5. On May 5, 1975, EPA announced the initiation of the Pesticide Enforcement Policy Statements (PEPS) series. These statements are published in the Federal Register and are intended to clarify EPA's policy regarding the enforcement of the Federal Insecticide, Fungicide and Rodenticide Act. PEP No. 1, published May 5, 1975, and September 17, 1975, allows for the use of a registered pesticide at less than the label dosage if such use is recommended in writing by a knowledgeable expert.

6. Integrated pest control methods which may combine chemical, manual, mechanical, or biological control techniques will be used where they minimize the adverse impact of pest control.

7. All proposed use of herbicides on public lands would be reviewed for approval in advance by the Bureau's Washington, D. C., office.

8. Federal and state agencies with responsibilities for the environment, public health, and fish and wildlife would be informed of programs and cooperative measures developed when necessary.

9. Only properly trained and/or licensed personnel would handle and use herbicides on public lands. This includes applications by permittees, grantees, or licensees. At least one member of the application crew and the BLM on-the-ground supervisor must be a certified applicator.

10. All individuals associated with the handling or application of herbicides on public lands would be familiar with emergency procedures to be used in case of a herbicide spill.

There would be specific measures included in the design of each proposed herbicide project in order to minimize adverse impacts on the environment. They include the following:

1. Any specific BLM-proposed herbicide project would be preceded by a preliminary archeological survey. An evaluation of the findings would determine whether there are sites of value and whether they should be salvaged by removal, or left and circumvented by the project.

2. The location of three forbs proposed to the federal list of threatened species has been determined during the 1977-1978 threatened and endangered plant survey. The proposed spraying program would avoid any areas supporting these plants. Specific buffer zones are supplied in item 8.

3. On herbicide application projects conducted directly by Bureau personnel, an employee holding a valid pesticide application certification would monitor and supervise the project. Work done by contractors would be carried out by individuals having a valid state certification.

4. Contracts for application would require that the intake operation of water for mixing shall be arranged so that an air gap or reservoir will be placed between the live water intake and the mixed tank to prevent any backflow of chemical into the water source.

5. Contracts for application would require that contractors not wash out any spray tanks in or near any streams or dispose of any chemical containers on the contract area.

6. During aerial spraying, spray would be turned off at the end of spray runs and during the time when a turn is being made to start another spray run. Initial spray swaths along buffer strips or other areas to be protected would be made parallel to these areas before spraying commences on the rest of the project area.

7. Mixing and loading operations would take place in an area where an accidental spill would not flow into a stream or body of water.

8. The following are minimum widths (measured horizontally) for unsprayed buffer strips for all herbicides applied adjacent to the Pecos River, any livestock watering locations, ranch houses, or known locations of threatened or endangered plants:

a.	Aerial Spraying	
	Spraying altitude (over ground)	Buffer Strip
	15-20 feet	1,500 feet
b.	Vehicle spraying	300 feet
c.	Hand application	100 feet

No foliar herbicide would be applied within 100 yards of livestock watering ponds or tanks, identified cliff, canyon, and draw habitats; within 300 yards of birds of prey nest sites; and 500 yards of identified groups of native desert trees (Information regarding specific locations of birds of prey nesting sites is contained in District files. Zones containing cliff, canyon, and draw habitats and native desert trees are shown on Map 1-1).

9. To minimize drift and volatilization, aerial applications of all the herbicides proposed for use would be confined to periods when wind speed is less than seven miles per hour, air temperature is under 85 degrees F., precipitation is not occurring or imminent, and air turbulence would not affect normal spray patterns. Label directions would be followed if they require additional restrictions. Low volatility formulations would be used.

10. Daily measurements of weather conditions would be made by trained personnel at spray sites during application. Additional measurements would be made at any time that a weather change appears to be taking place which could jeopardize safe placement of the spray on the target area.

11. Spray aircraft would normally be required to fly at an airspeed of less than 100 mph and less than 20 feet above the vegetation unless obstructions are encountered. Maximum drift reduction with normal spray formulations and conventional application equipment would be obtained by using D8 jet nozzles directed back along the airstream (Stewart and Gratkowski 1976). Nozzle size and pressure would be designed to produce droplets with a diameter of 200-300 microns. All aerial nozzles would be equipped with automatic shutoff devices to prevent loss of herbicide along nonspray flight routes. Spray mixtures would contain drift reduction adjuvants where they would be effective.

12. During air operations, a radio network would be maintained which links all parts of the project. Direct radio communications between spray aircraft and ground observers would be established. Reconnaissance flights would be made before spraying begins to orient pilots as to locations of sensitive areas such as agricultural lands which are adjacent to spray targets.

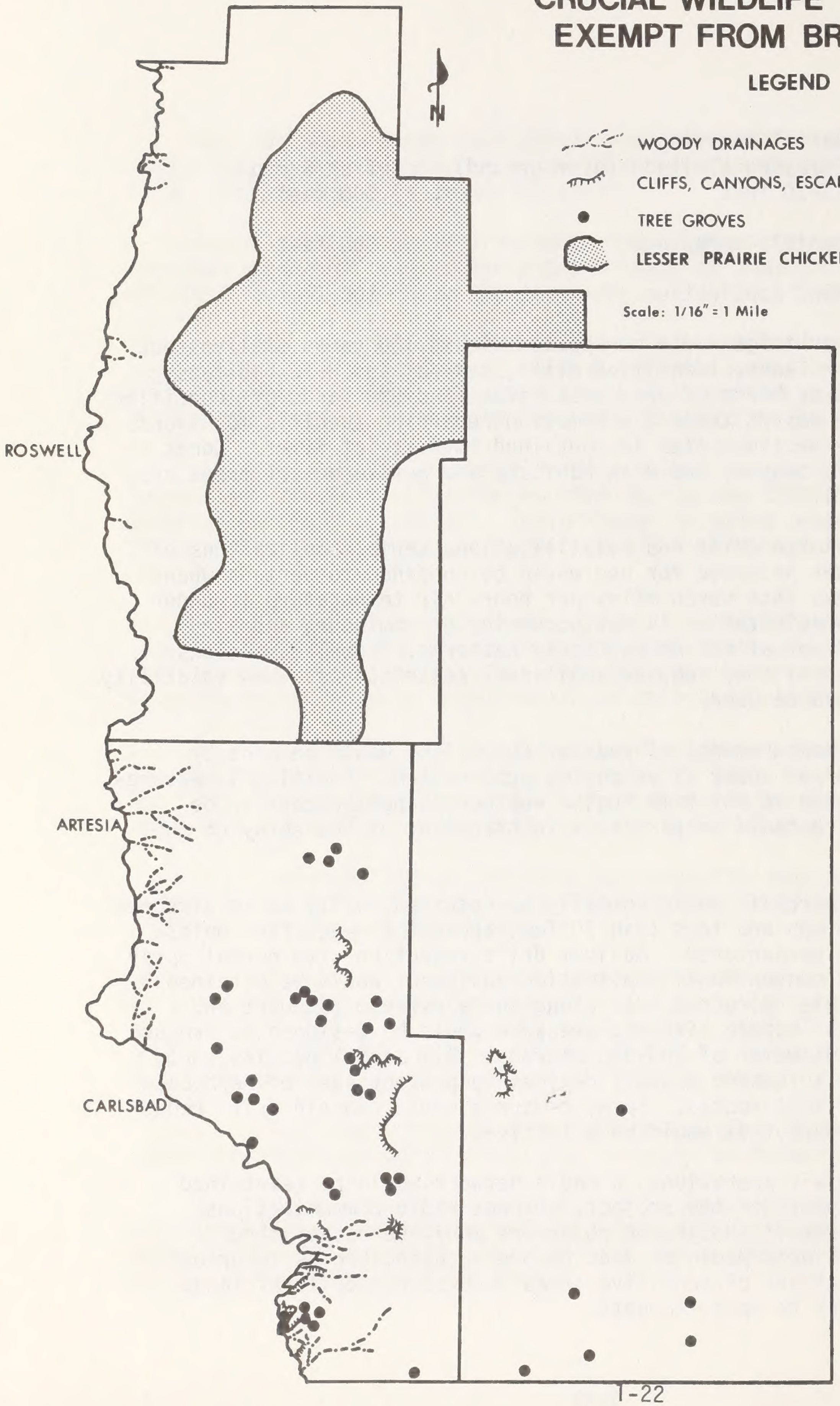
MAP NO 1-1

CRUCIAL WILDLIFE HABITAT AREAS EXEMPT FROM BRUSH CONTROL

LEGEND

WOODY DRAINAGES
CLIFFS, CANYONS, ESCARPMENTS
● TREE GROVES
▨ LESSER PRAIRIE CHICKEN AREA

Scale: 1/16" = 1 Mile



13. All livestock would be removed from treated pastures prior to aerial spraying or ground applications.

14. Grazing would not be permitted in treated pastures for 16 months following treatment. Applications would be in strict conformity with label instructions. Each applicator would be trained in the correct operation of spray equipment, prevention of plumbing leaks, safe handling and mixing of herbicides, control of application rate, and would be supervised by licensed personnel. Radio communication would be maintained with any vehicle transporting or spraying herbicide.

The overall responsibility for monitoring environmental impacts of chemical herbicides rests with the Environmental Protection Agency (P.L. 92-516, Sec. 20).

Research on environmental impacts of herbicides to animals, water, soil, and plants is conducted by chemical companies as a prerequisite to registration with the Environmental Protection Agency. Additional research is conducted by federal agencies and universities. The Bureau would keep abreast of these research findings and adjust its proposed herbicide applications as indicated by research results and EPA recommendations.

Vegetative response would be monitored with appropriate photo-stations and vegetation sampling transects being established prior to treatment. Onsite data evaluating herbicide effectiveness and the resulting secondary succession would be collected to continually improve the brush control process.

The safe use of herbicides includes precautionary measures to prevent accidental spills. The following precautions describe the measures that would be used to reduce the chance of such accidents, and the emergency action which would be required if an accidental spill should occur.

The applicable federal regulations concerning the storage and disposal of herbicides and herbicide containers would be followed. These are described in the Environmental Protection Agency "Regulations for Acceptance and Procedures for Disposal and Storage," Federal Register May 1, 1974, pages 15236 through 15241.

During Transportation:

1. It is essential to prevent damage to containers so that leaks do not develop, care would be exercised so that the containers are not punctured or ruptured, and so that the lids or caps are not loosened.

2. Precautions would be taken in the loading and stacking of herbicide containers on the transporting vehicle to assure that containers are tied down so that they do not fall when the vehicle moves.

3. Open containers would never be transported. Partly empty containers would be securely resealed before transport.

4. After transportation, all herbicide containers would be inspected for damage and leaks, and the vehicle must be carefully examined for contamination.

During Application:

1. Spraying schedules would be arranged so that poor visibility before and shortly after sunrise and sunset would not seriously affect the safety of the pilot.

2. Spraying from a higher altitude would be allowed where steep terrain in the spray area would make it hazardous to spray at the specified contract heights.

3. To eliminate the need to climb in returning for another spray run, the pilot would be allowed to gain sufficient elevation at the lower open end of drainages after a spraying run.

4. The contractor's chief pilot would be allowed to establish a pattern to avoid danger of collision when pilots spray adjoining blocks concurrently.

5. The pilot would be instructed to stop spraying when, in his own judgment, conditions are too hazardous.

6. The pilot would be instructed to fly at a height above the ground that would produce effective treatment results. In no case should the minimum flight height be less than five feet.

7. Pilots would be cautioned about dangers such as topographic features and location of downdrafts. Project maps would be reviewed with each pilot, paying particular attention to landing strips, areas being sprayed, and approaches to and from those areas.

8. Pilots would be cautioned as to the location of telephone and electric lines near any landing strip which would be used. Telephone and electric lines would be marked with highly visible material if it can be done safely.

9. If an aircraft crashes, the pilot's clothing would be checked to see if he has been splashed with herbicide. If so, and if he is not seriously injured, he would be washed several times with soap.

10. Should a pilot be injured and taken to a hospital or doctor, they would be informed that the pilot has been exposed to a herbicide and would be provided any herbicide label information that is available.

11. Before applying chemicals by hand, all new crew members would receive orientation as to the reason for use of the chemical; the proper handling and application of the chemical, and the care of applicators.

Tanker Precautions:

1. All valves capable of emptying the tanker would be lockable.

2. An air gap or reservoir between the water source and the mixing tank would be required. A separate portable pump may be used.

3. Spray solutions would be mixed away from streams, drains, or ditches leading to streams where spills could reach a stream if they occurred.

4. The movement of loaded herbicide tankers would be planned to minimize travel adjacent to streams.

If Spills Occur:

In the event of a spill, the project inspector or crew foreman would immediately implement measures to contain the herbicide. The following individuals would be notified as soon as possible: 1. the area manager, 2. the district manager, 3. the State Office pesticide-use coordinator, and 4. the New Mexico Department of Agriculture, pesticide regulation division.

1. Herbicides would be contained by diking and collecting pools. The location and availability of earthmoving equipment close to the project would be noted.

2. The Environmental Protection Agency would be notified immediately if a major spill should occur.

3. The surrounding area would be inspected for contamination.

Criteria used in the selection of herbicides are based on guidelines and policies issued by the Department of Interior. These criteria are briefly outlined in the following discussion.

1. The chemical proposed for use is not prohibited by the Department of Interior.

2. Chemicals on the Department of Interior restricted list are only used when:

   a. Nonchemical techniques have been considered and found inadequate.

b. Use can be limited to a relatively small scale application.

3. Use of any chemical is aimed at a specific pest problem and involves both minimum strength and frequency of application.

4. Chemical pesticides would not be used alone when nonchemical or integrated chemical and nonchemical techniques offer an environmentally feasible alternative.

5. No pesticide would be used when there is evidence to show that:

a. Water quality would be degraded.
b. Hazards exist that would unnecessarily threaten fish, wildlife, their food chain, or other components of the natural environment.

6. Herbicides proposed for use must be registered by the Environmental Protection Agency (EPA) according to Public Law 92-516. This law requires a determination by EPA that the chemical "will perform its intended function without unreasonable adverse effects on the environment." If registration of any herbicide is revoked or modified for rangeland use by the Environmental Protection Agency, use of that herbicide by the Bureau will be terminated or modified accordingly.

The use of 2,4,5-T and Silvex is no longer authorized for use by BLM. However, BLM resource specialists anticipate that applications of a combination of dicamba, picloram, and diesel fuel in a water carrier would result in brush control to a degree similar to that displayed by 2,4,5-T and Silvex. Field trials have not been extensive enough to be certain of results with regard to the percentage of brush kill but initial results indicate that a high percentage is possible. Effects on environmental elements have been studied and the resulting information is available for determining impacts.

Preliminary studies released by Pete Jacoby, Texas A & M University involving mesquite control research in west and northwest Texas, indicate that mesquite control would be possible using mixtures of dicamba and picloram. Jesse Girard (New Mexico State University) and Dr. Carlton Herbel (USDA), both herbicide specialists, have indicated during personal communications that control of mesquite would be possible using a mixture of picloram and dicamba, and that picloram granules could be used to control creosote.

Dicamba (trade name "Banvel") is a selective herbicide when applied as directed. It is effective for weed and brush control on rangeland. Recommended applications are for aerial spraying and ground applied granules. The proposed treatment for ground-applications of herbicides to individual mesquite plants is 6 grams of the active ingredient for each 16 square feet of canopy.

Picloram (trade name "Tordon") is also a selective herbicide when applied as directed. It is widely used in rangeland brush control programs. The proposed dosage for picloram is one pound of active ingredient per acre for control of creosote.

Combinations of herbicides would be used as recommended by knowledgeable scientists. Combinations are frequently more effective in controlling a particular species than one chemical alone. Picloram is proposed for use as a spray and in a dry granular form. The combination of 1/4 pound dicamba (active ingredient) plus 1/4 pound picloram (active ingredient) per acre is proposed as an aerial spray on mesquite.

The proposed spraying program would rely on water as a carrier of the chemical. The utilization of one quart of diesel fuel within the total mix of two gallons per acre (one quart of fuel per 43,560 square feet) is necessary to inhibit evaporation of the chemical and allow plant intake through dispersion over the leaf surfaces.

Livestock Facilities

Proposed livestock facilities would be designed to distribute livestock and to control their movement to facilitate application of those specific grazing systems necessary to meet multiple-use objectives.

These projects would consist of fences and water developments. On cattle ranges having antelope habitat, fences would be designed to permit antelope movement. Such fences would be three-strand wire with a smooth bottom wire a minimum of 16 inches above the ground line with two barbed wires above. The top wire would be no more than 38 inches above the ground line. On ranges without antelope habitat, fences would be of the standard four-strand barbed wire design. There is no bottom wire limitation, however, there is a 42-inch limit to the top wire. Types of water developments would be based on site-specific feasibility costs and their ability to meet multiple-use objectives. Water developments considered would be wells, catchments, dirt tanks, and earthen reservoirs with associated pipelines and troughs. Table 1-9 lists amounts and kinds of facilities, existing and proposed for the ES area. This same information is shown by allotment on Appendix Table A-7.

Standard Operating Procedures

Standard BLM operating procedures are designed to insure that the most acceptable practices for any given site are used during the period that range improvement projects are being undertaken and specific grazing systems are being applied. To insure that the proper safeguards are applied, certain design features would be considered and site-specific environmental evaluations made. These procedures would be applied under the proposed action or under any of the alternatives.

Each specific action (project or grazing system) would be further evaluated to determine if any site-specific values would be impacted differently than as described in this statement. The following items would be incorporated as a part of that process of analysis:

TABLE 1-9
LIVESTOCK FACILITIES ON PUBLIC LANDS
(Summary from Table A-5 in Appendix)

Allotment Category	Kind	Units	Existing	Proposed
Specific Grazing Systems to be revised	Water sites	No.	202	56
	Fences	Mi.	838	41
	Cattleguards	No.	171	0
	Corrals	No.	28	0
Specific Grazing Systems to be developed	Water sites	No.	271	183
	Fences	Mi.	1,618	154
	Cattleguards	No.	214	0
	Corrals	No.	33	0
No Specific Grazing Systems	Water sites	No.	21	7
	Fences	Mi.	262	8
	Cattleguards	No.	57	0
	Corrals	No.	6	0
Unallotted Parcels	Water sites	No.	0	0
	Fences	Mi.	0	0
	Cattleguards	No.	0	0
	Corrals	No.	0	0
Summary:	Water sites	No.	494	246
	Fences	Mi.	2,718	203
	Cattleguards	No.	442	0
	Corrals	No.	67	0

1. Each site affected by the action would be surveyed by a qualified archeologist to determine if there are archeological values present.

2. Sites which may have potential paleontological values or which may be potential habitat for plants or animals listed as threatened or endangered would be examined to determine if any such values are present.

3. Soils and vegetation would be assessed to determine if disturbance of soils or of desirable vegetation would occur.

4. Wildlife habitat would be assessed and a determination made as to the specific effects to be expected should the action be taken.

5. The design, location, timing, and/or rehabilitation measures of specific actions would be reviewed to determine if modifications to those actions could be made which would reduce any adverse environmental impacts.

To insure that specific environmental elements are protected, the following design features and safeguards would be used whenever they are applicable:

1. Fence construction would conform with design constraints found in BLM Manual 1737, to meet wildlife habitat requirements.

2. Water for wildlife would be provided at watering facilities located on public lands, if a need is identified.

3. Areas meeting riparian and wetland habitat criteria would be protected to provide wildlife habitat. Protection measures would be selected for individual situations to include protective fencing, adjustments in livestock use, and/or establishment of buffer strips, as necessary.

4. Important habitat areas such as portions of broadleaf tree groves and the areas around dirt tanks, playas and watering tubs, would be fenced to provide islands of protected habitat (normally 2-3 acres in size). (See Table A-6 for locations of exclusion areas.)

5. During periods of drought or other emergencies, adjustments in livestock numbers would be made to guard against damage to the vegetal-soil resource. In instances where adjustments are needed, the operator would be contacted with adjustments being jointly agreed to, whenever possible. However, if an agreement cannot be reached, the needed adjustment would be put into effect by BLM decision.

6. Trees and large mesquite bushes (especially those containing nests of birds of prey) would be spared during brush control operations. Also, those portions of drainages leading into the Pecos River which contain the tall growth forms of woody species (approximately 1,000 acres) would be excluded from vegetative treatment programs.

7. Where soils and nontarget vegetation are disturbed, reclamation measures would be taken. These measures would include returning the land to as near its natural form as possible and reseeding with mixtures of grass, legumes, and forb seeds to prevent erosion.

8. There have been no new roads or trails proposed or identified as being needed. However, should any be identified during project design, they would be constructed only if existing roads and trails could not be used and then only after a site-specific environmental assessment has been prepared.

9. There would be no actions taken in roadless areas which are determined to have wilderness characteristics until the complete wilderness inventory and study required by Section 603 of the Federal Land Policy and Management Act of 1976 (FLPMA) is completed and Congress has acted. No action would be taken which would impair the suitability of such areas for preservation as wilderness.

10. Selection of specific sites for range improvements would require the assistance of the District soil scientist and the District engineer to ensure that highly erosive areas are avoided and to insure workability of the project.

11. A fire-management plan would be developed prior to any prescribed burning of vegetation.

12. Visual resources contrast ratings would be completed in the survey and design stage of all proposed developments (BLM Manual 6300) and appropriate mitigating measures would be implemented to meet the Visual Resource Management (VRM) class objectives for the area in which the action is located.

13. Areas which have cultural resource or paleontological values would be avoided whenever possible. Salvage operations would be undertaken by qualified archeologists or paleontologists on sites which cannot be avoided to mitigate the loss of information.

14. Areas containing threatened or endangered plants or animals would be avoided if adverse impacts would be expected to occur through implementation of the proposed action.

15. Areas where brush control measures are proposed would receive 16 months' rest starting with the first growing season following treatment.

16. Sections 201 and 202 of the Federal Land Policy and Management Act (FLPMA) require that, in preparing and maintaining an inventory of public lands and their resources and other values, priority be given to areas of critical environmental concern (ACEC). Priority is to be given to the designation and protection of ACEC in the development or revision of land-use plans.

The BLM in New Mexico has not as yet identified any ACEC through the Bureau planning system. However, it is likely that several areas within the ES area might possibly meet those criteria necessary to qualify as ACEC. Due to the wide array of management prescriptions possible for each potential ACEC, assessment of environmental impacts caused by the proposed action cannot be adequately made at this time. Whenever ACEC are identified, appropriate measures would be implemented to protect critical resource values.

IMPLEMENTATION SCHEDULE

The proposed action would be accomplished over an eight-year period, starting in 1980. Livestock adjustments would be initiated during the first year and would extend over a three-year period (1980 to 1983). Specific grazing systems would be developed and any revisions would be accomplished during the first three years. Scheduling would be based on geographic areas with allotments closest to Roswell, Hobbs, and Carlsbad being completed first and radiating outward as development is completed. Range improvements would be scheduled on a similar basis with initial treatments and facilities being started as soon as specific project layout and designs are completed and project-specific environmental assessment reports are completed.

Vegetative treatments would be scheduled so that no more than 25 percent of an allotment's initial forage resource would be required to be rested from grazing during the implementation period. To accomplish this, 25 percent of an allotment would be treated the first year; nothing would be treated the second year. Forage production on the treated portion is anticipated to increase to a level that, along with only 50 percent of the remaining area, it would support the livestock for which initial forage allocations were made. The third year, another 25 percent of the area would be treated, followed the fourth and fifth years by another 25 percent each year until the entire area has been treated.

In the event that forage responses do not reach the anticipated levels of production, the implementation period would be further extended so that livestock numbers would not be reduced more than the initial 25 percent at any one time.

MONITORING, EVALUATION, AND ADJUSTMENT OF THE PROPOSED ACTION

Monitoring of the grazing management program would be necessary to determine results of the grazing treatments, vegetative treatments, and the development of new facilities on the ES area's environment. Appropriate monitoring techniques would be used to insure that changes can be identified and quantified. As a minimum, the studies would be designed to include the annual livestock grazing use (actual), the degree of forage use (annually), the trend in range condition (over a period of time), and the climatic conditions (seasonally). These studies would be initiated prior to making any changes under the proposed action, except for adjustment of livestock numbers and would be accomplished under BLM Manual 4413 guidelines. All grazing systems would be evaluated at the end of each grazing treatment cycle as provided for in BLM Manual 4413. Information on wildlife and other resources would be collected and analyzed. Where objectives are not being met, the grazing systems would be modified or the vegetative treatment practices adjusted. Modifications would be planned to include changes in the grazing use, season of use, additional range developments, method of vegetative treatment, or any combination of these in order to attain the objectives. Modifications would require the preparation of an environmental assessment report (EAR) or a supplement to this ES before significant changes could be effected.

During periods of drought, substantiated by rainfall records, or other emergencies, adjustments in livestock numbers would be made to guard against damage to the soil-vegetal resource. In instances where adjustments are needed, the operator would be contacted and adjustments would be jointly agreed upon, whenever possible. If an agreement cannot be reached, then the needed adjustment would be put into effect by BLM decision.

GRAZING ADMINISTRATION

Livestock grazing would be authorized through the issuance of term permits and leases containing appropriate terms and conditions which would be subject to annual reviews and modifications as required by land use plans and applicable laws.

Anyone performing acts which are prohibited under Title 43, Code of Federal Regulations, Subpart 4140, may be subjected to civil penalties or to both civil and criminal penalties. Violators would be liable in damages to the United States for the forage consumed by their livestock, for injury to federal property caused by their unauthorized grazing use, and for expenses incurred in impoundment and disposal. Trespass actions would be taken whenever prohibited actions are observed. A constant monitoring of such uses would be expected to occur.

INTERRELATIONSHIPS WITH OTHER FEDERAL, STATE, AND LOCAL PROGRAMS

This proposal is interrelated with programs of other agencies. For ease of discussion, the programs are listed by agency involved.

Soil Conservation Service (SCS)

Programs Involved: Ranch Planning and Great Plains Contracts

Interrelationship: Both of these programs involve working with ranchers to apply conservation measures to the ranch operation. If the public lands are involved in the ranch operation, coordination between the BLM, the rancher, and the SCS would be necessary. The proposed action identifies those areas where BLM would take the initiative to coordinate with the rancher and the SCS to develop specific grazing plans (proposed "specific grazing" systems). It would also identify those areas where BLM would not take the initiative for coordination ("no specific grazing" system). The proposal also identifies range improvement projects which would be carried out on the public lands. Range improvement projects on private lands may also be developed through a cooperative effort in conjunction with the public lands projects.

Agricultural Stabilization and Conservation Service (ASCS)

Program Involved: Cost/Share

Interrelationship: The ASCS enters into cost/share programs with private land owners to improve the conditions of private lands. These programs are often in cooperation with the SCS's Ranch Planning Programs. With development of the BLM's proposed action, corresponding range improvements on private lands could be developed and partially funded through this ASCS program, resulting in a total range improvement which would not necessarily be possible, if attempted independently of the BLM's proposed action.

Natural Resource Conservation Districts (NRCD)

Programs Involved: Conservation and Management Planning; Watershed Protection and Flood Prevention; Environmental Assessments and Statements; Resource Conservation and Development; Water Uses and Rights; and Wildlife Management.

Interrelationship: Based on existing Memorandums of Understanding between the Soil Conservation Service (SCS), and U. S. Forest Service, and the Bureau of Land Management (BLM) which were concurred with by the Agriculatural Stabilization and Conservation Service and endorsed by the New Mexico Association of Natural Resource Conservation Districts (NRCD), those programs proposed in this environmental statement which involve the above stated areas of mutual interest would be coordinated with the NRCDs. This would foster mutual understanding and a spirit of cooperation.

Managers of Other Lands: Private, State, and Other Federal

The Bureau of Reclamation (BR), Federal Energy Regulatory Commission (FERC), Department of Energy (DOE), New Mexico Land Commission, and individuals from the private sector all manage lands within this ES area.

Programs Involved: Land Management and Land Use.

Interrelationship: There are lands owned, controlled, and/or administered by these managers intermingled with federal lands upon which the proposed action may have an effect. Where physical barriers to livestock movement are not present (or do not prevent livestock which are grazing nonpublic lands from entering onto public lands), constraints may be imposed as to livestock numbers, kinds, and authorized periods of time for grazing to prevent damage to the public land. At the same time, livestock which are authorized to graze public lands may enter onto these nonpublic lands. Because of this, any authorization granted or constraint placed on livestock grazing of the public lands would also affect any intermingled nonpublic lands which are not physically segregated (fenced).

There are approximately 793,988 acres of these lands intermingled with the public lands. The majority of these nonpublic lands are owned by the State of New Mexico and are leased by ranchers for livestock grazing purposes (See Visual A for configuration of types of land ownership. Appendix Table A-2 lists the amount of land, by type of ownership, within each allotment). A problem exists because of this mixing of land ownership patterns. The landowner or manager who does not want his private or state land grazed in the same manner as would be required of the public lands, would be responsible for ensuring separation of use through fencing or some other means. Due to costs, fencing would not generally be considered a practical alternative because of the highly scattered, irregular tracts of nonpublic lands. However, exchanges to consolidate ownership could be initiated. These exchanges would reduce the miles of fencing required, reducing the costs necessary to segregate use.

Ranchers would use their nonpublic lands for the same number of livestock and in the same manner that they are authorized to graze the public lands or they could enter into an "exchange of use" agreement allowing them credit for forage produced on controlled nonpublic lands, to the extent that such forage is determined to be available. BLM specialists would determine the amount of forage available. This determination would be set at a level comparable to the public lands, to ensure that overuse of those public lands would not occur.

Under an "exchange of use" agreement, the rancher would be issued an authorization to graze a specific number of livestock in a specified manner, based on the forage production of the combined public and controlled nonpublic lands. The manner of specified grazing would be developed through consultation with the rancher and designed to protect the public land resource. While the rancher may not necessarily approve of the specific grazing program designated, his interests would be considered. The rancher would be charged only for the amount of forage produced on the public lands.

United States Fish and Wildlife Service (FWS)

Program Involved: Threatened or Endangered Species

Interrelationship: Based on present data, the District Manager has determined that the proposed action would not have an effect on threatened or endangered species or their habitat. However, further information gained during specific project layout and design may indicate that an effect does exist. In such an event, formal consultations with the FWS under Section 7 of the Endangered Species Act would be initiated. These consultations may then result in alteration or abandonment of proposed range improvements.

New Mexico Department of Game and Fish

Program Involved: Wildlife Management

Interrelationship: The program of wildlife management of the New Mexico Department of Game and Fish (NMDG&F) would be directly related to the proposed action, through the BLM's responsibility to manage wildlife habitat on public lands. The achievement of the NMDG&F wildlife management objective to produce a harvestable surplus of wildlife (approximately 1,900 deer and 1,000 antelope) depends to a large degree on resolution of habitat problems. Conflicts between big game habitat and livestock grazing would be eliminated through an allocation of forage to big game which provides for an increase as their numbers increase. Density estimates of big game populations and areas of occupied habitat for forage allocations were provided to BLM by this agency. In addition, conflicts would be further reduced by the implementation of "specific grazing" systems designed to consider wildlife habitat requirements and seasonal preferences. Creation of livestock exclusion areas for lesser prairie chicken nesting would reduce habitat conflicts and would have a positive effect on the species population.

Local, Regional, and County Planning

Programs Involved: Sureste Resource Conservation and Development Project, Southeast New Mexico Economic Development District, Lea County Land Use Planning Report (1973), Eddy County Land Use Plan (1977), and Chaves County Comprehensive Land Use Planning and Zoning Report (1977).

Some of the recommendations contained in these reports are directly in support of the proposed action for this ES. Although none of these plans or groups have any jurisdiction over the public lands, it is noteworthy that many of the recommendations made in these plans are applicable to the public lands and have been incorporated into the proposed action. Chapter 9 of this document provides additional detail regarding specific recommendations.

CHAPTER 2

DESCRIPTION OF THE ENVIRONMENT

Chapter 2

DESCRIPTION OF THE ENVIRONMENT

PHYSICAL SETTING

The following sections describe the East Roswell Environmental Statement (ES) Area as it exists today. Descriptive emphasis has been placed on those items which are most likely to be impacted if the proposed action is implemented.

This area's climate is generally classified as semiarid to arid (Thornwaite 1941) with an average growing season of 195 days (April 10 to October 30) although there are some minor variations between the northern and southern parts of the area. The last spring frost in the south is about March 30, with the first frost arriving approximately November 10. During the growing season, the daily temperatures average from 55 degrees to 80 degrees fahrenheit. There are frequent highs of 100 degrees or higher during the summer and records indicate that the average annual temperatures have been increasing in Roswell over the last century.

Precipitation during the growing season (April - October) averages from 8 inches in the west to 14 inches in the east. Available moisture in spring and summer is mainly from the Gulf of Mexico and accounts for about 80 percent of the annual precipitation which averages 9.6 inches. Records for most stations (Roswell, Artesia, Jal, and Carlsbad) indicate a slight but distinct decline in precipitation from 1878 to 1977 (URA; Geohydrology Associates 1978; and Climate and Dispersion Meteorology of BLM Lands in New Mexico 1978).

Sedimentary rocks as old as 280 million years are found at the surface along the eastern rim of the Pecos River Valley, although such occurrences are few in relation to the age of most exposed geologic formations in the ES area. Within the valley, deposits of gravel, sand, silt, and clay of fairly recent age (the oldest perhaps 1 million years) are found in a series of terraces related to the various climatic cycles. In the area known as the Mescalero Pediment, east of the Pecos River, a wide blanket of wind-blown sand, caliche, and alluvium covers most rocks, although a few of the older sediments are exposed in scattered outcrops. These deposits are, in turn, bounded by the gravels and caliche caps of the Llano Estacado (Meyer 1966; Ruhe 1967; and Kelly 1971).

The Llano Estacado, the Mescalero Pediment, and the Pecos River Valley are the major landscape features of the ES area. Elevations range from 2,900 to 4,700 feet. To the east, the southern edge of the High Plains (the Llano) is dominant, with the maximum elevations being located in the northeast. The Llano is bounded on the west by the Mescalero Ridge (locally known as the Caprock) which has elevations reaching 4,500 feet. This ridge forms a winding terrain feature originating in the north at San Juan Mesa and running southwards until it breaks down in the sandy areas of Lea County.

The Mescalero Pediment consists of sandy plains which slope gently westwards towards the Pecos River from the Caprock. The ES area's western border is the Pecos River flowing from north to south in a valley ranging from 3,800 to 2,900 feet in elevation. This valley contains several gravelly terraces which are broad and flat. At ground level, these terraces appear to be simply a part of the Mescalero Pediment

Additional information is available in the BLM's Roswell District Unit Resource Analysis (URA), Step 2, East Chaves, East Eddy, and Lea County Planning Units.

VEGETATION

In the early and mid-1800's, before extensive livestock development on the western grasslands, the southeastern plains of New Mexico were vegetated by shortgrass prairies (Whitfield and Beuter 1938; Dick-Peddie 1965). These grassland communities were dominated by the grama grasses (black grama, blue grama, gyp grama, hairy grama, and sideoats grama), bluestem, threeawn, and dropseed grasses. Some low densities of brush (e.g., mesquite, shinnery oak, creosote) were evidently scattered throughout the ES area. On the Jornada Range, 150 miles to the west, mesquite dominated less than 5 percent of the area in 1858 and creosote only 0.5 percent (Herbel et al., 1973). However, dramatic changes in vegetation, influenced by a combination of climate (Wedel 1957; Hastings and Turner 1966), cessation of natural wild prairie fires (Humphrey 1952; Humphrey and Mehrhoff 1958; Wright 1975), and poor livestock management (Haskel 1945; Brown 1950) caused heavy invasions of mesquite and creosote onto previously brush-free ranges. The main mesquite invasion was on sandy soils. Mesquite seeds, being highly palatable to livestock, were rapidly dispersed through livestock droppings. In areas where grass cover had been severely depleted by excessive livestock grazing and drought, mesquite rapidly established and spread. The spread of creosote was aided by similar conditions although not through livestock ingesting seed. Hot prairie fires which were common in drought years were probably effective in controlling the spread of mesquite or creosote plants which were very young or weakened by drought (Wright 1975). However, as the grasses which were necessary as fuel became depleted due to competition with dense mesquite stands and improperly managed livestock grazing, the wild prairie fires became too infrequent to halt the spread of brush. Although quantitative historical data is not available for the ES area, mesquite and creosote dominance on the Jornada had increased to 50 percent and 14 percent respectively by 1963 (Herbel et al., 1973).

Grasslands currently dominate less than 10 percent (approximately 100,000 acres) of the public lands in the ES area. About 90 percent of the area now supports stands of mesquite (about 900,000 acres), creosote (about 115,000 acres) and shinnery oak (about 480,000 acres). It is not possible to determine the precise acreage which was brush-free 100 years ago, however, SCS range site descriptions suggest that only 10 to 20 percent of the area supported mesquite or other brush when the range was in its natural condition. This theory is supported by some historical journals. Lt. N. Michler, Jr. (1850), an early traveler across the southern Llano Estacado and sandhill areas about 50 - 100 miles southeast of Hobbs, remarked that the area was similar to a "high arid plain, perfectly destitute of timber, scarcely a sprig of mesquite except in the neighboring water holes . . . The grass was scattering and miserably poor; occasionally a small spot of mesquite was found." Similar records to the north of Lieutenant Michler's travels indicated that not a tree, shrub, or other object relieved the monotony of the desert prairie (Marcy 1849).

Production, Range Condition, and Trend

A vegetative inventory was conducted by Rangeland Resources International, Inc., under BLM contract in the summers of 1977 and 1978 to determine existing forage production on all allotments. Vegetative data were delivered in terms of usable forage, AUMs (1 AUM = 770 pounds of livestock forage). This represents less than one-half of the total vegetative production. Production of the total vegetation complex was not measured in this inventory. Methodology used in this inventory is described in Appendix 1.

Existing production on AMPs was estimated to be 64,313 AUMs, 102,170 AUMs on allotments proposed for specific grazing management, and 8,684 AUMs on allotments without specific grazing management being proposed for a total of 175,161 AUMs. This production is only a measure of forage which is properly usable by grazing animals. Allotment-specific totals for existing and potential production are in Appendix 1, Table A-8.

Range condition, in terms of suitability for livestock grazing and apparent trend was evaluated on each allotment by BLM personnel in 1976 and 1977. Range condition for livestock grazing as determined by transect data is described in detail in Appendix 2. A summary of existing production is shown on Table 2-1. Existing condition for livestock grazing and apparent trend are summarized on Table 2-2. Presently 352,000 acres are in good condition, 1,169,000 acres are in fair condition, and 69,000 acres are in poor condition. Data were not available to evaluate amounts of ground covered by vegetation, litter, or rock.

Distribution of the various grassland subtypes is closely related to distinctly different soil units known as range sites. As defined by the Society for Range Management (1974), a range site in the "absence of abnormal disturbance and physical site deterioration, has the potential to support a native plant community typified by an association of species different from that of other sites." Range sites differ in the proportion of species present and in their productivity. Appendix 2, Table B-1 lists the major range sites in the ES area and the most common vegetative

TABLE 2-1
EXISTING AND POTENTIAL FORAGE PRODUCTION
(Source: Roswell District Files)

Management Category	Present Forage Production: All Range Site[a] (AUMs)	Anticipated future forage production by range site. Range Sites by Dominant Species[b]	Range Site Acres	Production (AUMs)
Existing Specific Grazing Management (582,956 acres)	64,313			143,078
		Black Grama		
		Gravelly	34,173	7,804
		Shallow Sand	14,923	4,394
		Limestone Hills	41	10
		Total	49,137	12,208
		Dropseed/Bluestem		
		Deep Sand	243,365	64,650
		Sand Hills	98,185	15,310
		Limey	746	181
		Total	342,296	80,141
		Sacatons/Tobosa		
		Bottomland	17,125	8,723
		Salty Bottomland	0	0
		Total	17,125	8,723
		Dropseed/Black Grama/Bluestem		
		Sandy	115,711	31,532
		Loamy	36,351	8,073
		Very Shallow	0	0
		Shallow	54	8
		Total	152,116	39,613
		Gyp Grama		
		Gyp Breaks/Gyp Hills	1,081	81
		Gyp Uplands	21,201	2,312
		Total	22,282	2,393
Proposed Specific Grazing Management (930,356 acres)	102,170			219,948
		Black Grama		
		Gravelly	57,470	12,205
		Shallow Sand	4,441	1,177
		Limestone Hills	467	10
		Total	62,378	13,392
		Dropseed/Bluestem		
		Deep Sand	375,594	96,606
		Sand Hills	158,325	18,669
		Limey	2,405	715
		Total	536,324	115,990
		Sacatons/Tobosa		
		Bottomland	19,846	7,286
		Salty Bottomland	4,360	2,831
		Total	24,206	10,117
		Dropseed/Black Grama/Bluestem		
		Sandy	167,764	50,591
		Loamy	74,045	21,618
		Very Shallow	970	274
		Shallow	5,501	1,036
		Total	248,280	73,519
		Gyp Grama		
		Gyp Breaks/Gyp Hills	13,853	1,306
		Gyp Uplands	45,315	5,624
		Total	59,168	6,930
No Specific Grazing Management (76,822 acres)	8,684			8,684
		Black Grama		
		Gravelly	7,595	714
		Shallow Sand	65	12
		Limestone Hills	0	0
		Total	7,660	726
		Dropseed/Bluestem		
		Deep Sand	28,100	3,501
		Sand Hills	11,184	1,088
		Limey	341	38
		Total	39,625	4,627
		Sacatons/Tobosa		
		Bottomland	1,293	128
		Salty Bottomland	259	13
		Total	1,552	141
		Dropseed/Black Grama/Bluestem		
		Sandy	17,522	2,079
		Loamy	5,341	849
		Very Shallow	296	26
		Shallow	1,441	84
		Total	24,600	3,038
		Gyp Grama		
		Gyp Breaks/Gyp Hills	788	39
		Gyp Uplands	2,597	113
		Total	3,385	152
Grand Total (1,590,134 acres)	175,167			371,710

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[a] Forage production as shown represents that portion of the vegetative production that is properly usable by grazing animals. It is less than one half of the total vegetative production (see the discussion of proper use in Appendix 1).

[b] Species which dominate the respective range sites when they are in excellent climax condition.

TABLE 2-2
EXISTING AND POTENTIAL RANGE CONDITION AND TREND
(Source: Roswell District Files)

Range Condition and Apparent Trend[a] by Management Category	Present Situation (Approximate Acres)	Anticipated Future Situation (Approximate Acres)
Existing Specific Grazing Management	583,000	583,000
Range Condition		
Good	87,000	495,000
Fair	496,000	88,000
Poor	0	0
Apparent Trend		
Up	175,000	525,000
Static	408,000	58,000
Down	0	0
Proposed Specific Grazing Management	930,000	930,000
Range Condition		
Good	240,000	786,000
Fair	630,000	114,000
Poor	60,000	20,000
Apparent Trend		
Up	785,000	830,000
Static	110,000	83,000
Down	35,000	17,000
No Specific Grazing Management	77,000	77,000
Range Condition		
Good	25,000	25,000
Fair	43,000	43,000
Poor	9,000	9,000
Apparent Trend		
Up	15,000	15,000
Static	58,000	58,000
Down	4,000	4,000
Summary for ES Area	1,590,000	1,590,000
Range Condition		
Good	352,000	1,306,000
Fair	1,169,000	245,000
Poor	69,000	29,000
Apparent Trend		
Up	975,000	1,370,000
Static	576,000	199,000
Down	39,000	21,000

[a] Apparent trend data are from only one year of evaluation.

aspect on each site. Visual D shows vegetative aspects and Visual E shows range sites for the ES area. A listing of the most common plants in the ES area is included in Appendix 2.

The SCS has determined that a range site occurring within two different major land resource areas (MLRA) actually has two different levels of productivity and, therefore, is actually two different range sites. Discrimination between two like-named range sites is accomplished by following the name with an abbreviation of the MLRA for that particular range site. For example, the sandy range site below the Caprock occurs in the southern desert (SD) MLRA, hence the name: Sandy-SD. The sandy range site in the cooler High Plains (HP) MLRA east of the Caprock is named Sandy-HP. All range sites mentioned hereafter in this document can be assumed to be SD sites because of their predominance in the ES area, unless otherwise indicated.

Ecological Climax Communities

Range site descriptions produced by the SCS allow the inference that five major plant communities, all of which are grasslands, once dominated and have the potential to dominate the ES area:

1. Black grama - Bush muhly
2. Dropseed - Bluestem
3. Sacatons - Tobosa
4. Dropseed - Black grama - Bluestem
5. Gyp grama

Black grama - bush muhly grassland would dominate the gravelly, shallow sand and limestone hills range sites on an approximate total of 120,000 acres of the ES area's public lands. A mixture of desert shrubs intersperse this community in good condition: creosote, javelina bush, littleleaf sumac, allthorn, condalia, and ratany.

The dropseed-bluestem grasslands would dominate the majority of the ES area (920,000 acres) on the deep sand, sand hills, and limey range sites. Shrubs such as shinnery oak, sand sagebrush, and yucca would contribute 15 to 20 percent of the total herbage production on these sites when in good condition. However, on most of these sites, mesquite and shinnery oak have dramatically increased (e.g., sites are in fair to poor condition) with a resulting decline in density of the dominant grasses.

Grasslands of giant sacaton, alkali sacaton, and tobosa dominate broad valleys and floodplains, the bottomland and salty bottomland range sites (currently about 40,000 acres). Mesquite invasion has occurred on nonsaline low lying areas, with some saltcedar increases in saline areas. Woody plant production is generally less than 10 percent of the plant community.

Grasslands dominated by gyp grama cover about 85,000 acres of the ES area. These areas are underlain by gypsum material from the soil surface to a depth of about one foot. The unique gypsum influence is reflected in the names of the major range sites of the gyp grama grasslands: gyp breaks, gyp hills, and gyp uplands range sites. Shrubs normally compose 15 to 25 percent of the production within these gyp grasslands, most notably creosote. Severe brush invasion has not occurred on most gyp areas due to the unsuitable gypsum soils.

Based on records of historical observations in eastern New Mexico and west Texas, BLM specialists assume that most of the existing brush is a result of invasion. Almost all fertile range sites in the area, e.g: deep sand, sandy, bottomland, loamy shallow sand, loamy sand, sandy plains, draws, range sites, and riparian land types are infested. The existing distribution of major brush species which are apparent to the casual observer on the landscape is presented on Visual E, "Vegetative Aspects."

Riparian zones are different from the grassland areas previously discussed. They occur as "scattered parcels of land in or adjacent to a drainage way and its floodplain, which are characterized by plant species different from those of the immediately surrounding nonriparian climax" communities (Lowry 1966). The main riparian zone is 3,400 acres in the eastern floodplain of the Pecos River, and is dominated by saltcedar and a few scattered cottonwood trees. Mesquite and fourwing saltbush are also common, frequently occurring as shrubs below the canopy of the large trees. This area is considered a part of the sacaton-tobosa grassland because these two grasses dominate the herbaceous plant community. Herbaceous vegetation is directly influenced by standing water and by the relative concentration of salts in the upper soil. Very saline areas do not support tobosa, buffalograss, or vine mesquite, but are dominated by inland saltgrass or sacatons. Only the river's edge supports occasional clumps of sedges, rushes, and cattails.

In years of abundant rainfall, some playas and dirt tanks in the area hold sufficient amounts of fresh water to permit growth of aquatic plants. Wild duck millet, pondweeds, spike rushes, and sedges have been documented in playas containing fresh water. However, a maximum of 100 acres of surface water is seldom, if ever, available yearlong.

The extremely saline water of Laguna Plata, Loving Salt Lake, and the Lea Lake overflow area do not support a diversity of aquatic plants. In these areas the semiaquatic, inland saltgrass is the primary plant.

Plant Phenology and Forage Values

Although the ES area is essentially frostfree for six months, vegetation is adapted to utilization of the short, rainy periods which occur in midsummer. Rapid growth initiates for warm season perennial grasses (i.e., black grama, dropseeds) after the high intensity thunderstorms of midsummer occur and is followed shortly by production and dispersal of seed (Table 2-3). Occasionally, perhaps one year in five, late spring and early summer are wet enough to allow many grasses to complete two growth cycles. Phenology data collected by Rangeland

Resources International during 1977 and 1978 reflect this broad range of growth periods, dependent primarily upon available moisture throughout the growing season.

TABLE 2-3
PHENOLOGY OF GRASSES, SHRUBS, AND FORBS
(Source: Phenology Study, Rangeland Resources International, Inc. 1978)

Plant Phenology	J	F	M	A	M	J	J	A	S	O	N	D
Grasses Warm Season Perennial	Dormant		Growth initiates			Boot		Seed, Curing or Regrowth			Dormant	
Cool Season Perennial	Dormant	Growth initiates		Boot	Seed and curing					Dormant		
Shrubs	Dormant		Growth initiates		Flowering		Seed ripe, curing, or regrowth				Dormant	
Forbs			Growth initiates		Flowering		Seed ripe, curing, or regrowth			Dormant		

Cool-season grasses (New Mexico feathergrass and needle-and-thread) are not common in the ES area. These grasses initiate growth in late winter (mid-February), growth accelerates during the spring with seed development and dispersal being accomplished by midsummer. Most cool-season grass seedlings are established by fall if summer rains are received. When green, these grasses are palatable for livestock, antelope, and deer.

Livestock graze most grasses in the area while they are green and succulent, including the sacatons, tobosa, and threeawn. However, livestock and wildlife graze selectively for certain grass species during most of the year. Plains bristlegrass, sideoats grama, bush muhly, and the dropseeds are palatable and are preferred livestock forage. Plants which reproduce mainly by seed lose vigor and density under heavy grazing pressure. Other grasses such as tobosa and alkalai sacaton are palatable only when green and actively growing. These two grasses are seldom used as indicators of proper livestock utilization levels because of their ability to thrive under continuous grazing and rather high stocking rates.

Black grama is a preferred forage in late fall and winter, receiving heavy livestock use because its stems remain green during the dormant season. Reproduction of black grama is primarily by stolons with florets seldom containing more than 10 percent viable seed (Watts 1965). (Specific proper use factors (PUF) assigned to each forage species are in the Roswell District files. The PUF methodology is discussed in Appendix 1.)

Rainfall strongly affects the growth of forbs with their abundance in spring being dependent upon good winter moisture. Globemallow, fillaree, ground cherry, wild onion, dalea, deer apples, and primroses are forbs which are highly preferred and are abundant in years with wet springs and summers (Russell 1964; Dufeld, et al., 1973).

Mesquite, shinnery oak, creosote, sand sagebrush, fourwing saltbush, and broom snakeweed are the area's primary woody plants. Mesquite is adapted to the area's broad range of soils and climatic conditions. The annual growth cycle is influenced by available moisture and soil temperature with leaf buds opening from late March to mid-April followed within 30 to 45 days by a full canopy. If adequate moisture persists, maximum trunk expansion takes place, accompanied by production and movement of carbohydrates and by seed formation (Haas, et al., 1973).

Reproduction of mesquite is through viable, long-lived seeds distributed from its pod. The pods are relished by livestock and deer. Germination and establishment of seedlings are the most critical stages of development with seedlings surviving if there is adequate moisture and moderate daytime temperatures (80 degrees to 85 degrees F.). During summer droughts or if there is not enough spring moisture, mesquite stops growing and remains dormant until conditions are more favorable. This plant loses its leaves and stops growing following the first frost (Haas, et al., 1973).

In the ES area, mesquite is a low, multistemmed shrub, seldom more than 5 feet tall. Roots commonly extend 40 feet deep and 50 feet laterally from well-established mesquite plants.

Shinnery oak begins growth shortly after the last freeze, sometime in early March, producing early buds and foliage which are highly palatable to livestock and deer. However, this early growth contains large amounts of the toxin, tannic acid, which may kill herbivores if not eaten in combination with grass (Schmutz, et al., 1968). Shinnery oak provides safe forage during midsummer and fall, and receives heavy grazing pressure during drought years. A resilient shrub, its vigor and density are rarely harmed by heavy grazing. Reproduction is primarily from the woody lateral roots called rhizomes. A single shinnery oak plant may consist of 100 or more above ground sprouts from one rhizome. Acorn production is very erratic in the ES area with abundant acorn crops seldom developing more than one year in 10 in Eddy and western Lea County, and less than one year in five in the higher rainfall region of northeastern Chaves County (BLM observation and personal communication with Leifeste, 1978). Acorns seldom germinate when produced (Petit and Kauffman 1977).

Creosote is an evergreen shrub, three to six feet tall. It has a very sparse foliage with resinous stems and leaves. Livestock and wildlife do not utilize creosote as forage. Active growth of creosote begins in midsummer after rains are received.

The evergreen shrub, sand sagebrush, is palatable to livestock and wildlife, receiving its heaviest use in winter and spring when more palatable herbage is not available. Abundant moisture is necessary during the growing season for rapid growth of sand sagebrush in spring and summer. The lowest levels of vigor and carbohydrate development are before summer rains. Reproduction is from seeds.

Another evergreen shrub, fourwing saltbush, is also an important forage shrub. Locally known as chamise, it is palatable and very nutritious forage for deer, antelope, and livestock. This shrub receives its heaviest use during dry summers and in winter when other herbage is unavailable. Reproduction is both by seed and root sprouting (Woodmansee and Potter 1970).

Broom snakeweed is a low-growing (less than 1 ft. tall), single-stemmed shrub which is common on areas which have been disturbed by earth moving equipment and also around livestock concentration areas. It has little to no value as forage, and has been reported to deplete soil moisture, thus seriously limiting grass and forb production (personal communication: Girard 1978).

Poisonous Plants

The ES area supports a number of plants which are potentially poisonous to livestock and wildlife. Although livestock losses are not common on ranges with abundant forage, extended dry periods or ranges in poor condition may force livestock to utilize poisonous plants. Plants which are most toxic in spring are shinnery oak, broom snakeweed, cocklebur, nightshade, and locoweed. Threadleaf groundsel poisoning is most likely during dry summers. Poisoning from rayless goldenrod would be more likely in the fall.

THREATENED OR ENDANGERED PLANTS

In 1973, the Endangered Species Act afforded federal protection to plant species in the United States which were either threatened or endangered. On July 1, 1975, a proposed list of all plants which potentially qualified for federal protection was published in the Federal Register. A June 16, 1976, revision of the proposed list contained the names of three plants within the east Roswell ES area which are proposed for inclusion on the federal list as threatened: *Phacelia integrifolia* var. *texana Torr.*, *Limonium limbatum* Small, and *Proboscidea sabulosa* Correll.

According to an extensive survey by Rangeland Resources International, Inc., all three plants on the proposed federal list were found in sufficient quantities to guarantee their survival in this area. No information is available about the ability of these plants to withstand grazing. However, none of these plants are considered to be palatable to cattle (Doctors David Northington and Richard Spellenburg, personal communication: 1978).

In 1977, *Proboscidea sabulosa* was found to be restricted to a localized clump of unstable sand dunes 15 miles west of Jal, Lea County, New Mexico. The range survey noted this small but stable population growing among shinnery oak and mesquite. However, in 1978, *P. sabulosa* was found to be very common in the southeastern corner of the ES area. Because this plant is an annual, the heavy 1977 summer and fall rains were probably responsible for its relative abundance in 1978.

Phacelia integrifolia var. *texana* was found to be common on shallow gypsum soils near Bottomless Lakes State Park, Chaves County, and near Lake McMillan, Eddy County. This plant is very glandular and foul smelling.

Stable populations of *Limonium limbatum* were found within the protected areas of Bottomless Lakes State Park and Bitter Lakes National Wildlife Refuge. This plant has a massive and vigorous root system and was found commonly in both locations among saltcedar on shallow flats and in depressions.

SOILS

Four separate surveys by the Soil Conservation Service (SCS) have inventoried soil types within this area and have gathered interpretive data about the representative soils present. These are: Soil Survey of Chaves County, southern part (1974); Soil Survey of BLM Lands, Chaves County, northern part (1977); Soil Survey, Eddy County Area (1971); and Soil Survey, Lea County (1974). Their survey results show that the area's soils are a mixture of mineral materials composed primarily of limestone, gypsum, windblown sediments, and carbonatic sources. Generally they range from being nearly level to gently sloping, a typical plains landscape. Areas of steep, rocky soils occur but are not extensive. These rocky soil areas are the breaks and hills along the Pecos River and the Mescalero Ridge. Data concerning these surveys are available at the Roswell District Office of the Bureau of Land Management and at the Soil Conservation Service offices in Roswell, Carlsbad, and Lovington, New Mexico.

Soils having similar features, e.g., their major layers are similar in texture, thickness, arrangement, and other important characteristics (soil series), are the basis for discussion in this ES area. These soils are shown on Appendix 2, Table B-2, Also listed are the range site and slope for each series plus surface texture, wind erodibility groups (WEG) and productivity for each series. Range sites are defined and discussed in the vegetative section of Chapter 2, with sites and groupings of soil series for each individual range site being listed in Appendix 2, Table B-3.

All series occurring in the same range site have similar range interpretations. Each series in a range site has similar vegetative types and erosion class ratings. Visual E, depicting range sites in the ES area is included in the pocket located inside the back cover.

Wind Erodibility Groups

A wind erodibility group (WEG) is a group of soils having the same wind erodibility potential. Methodology for determining the WEG of a soil is discussed in Appendix 2.

The texture of the surface inch of a soil, and carbonates within the soil together with its moisture and the percentage of coarse fragments, determine its susceptibility to wind erosion. Wind erodibility group ratings range from 1 to 8 (very high to slight). The methodology section also discusses how soils are placed in the various groups.

Soils in deep sand, sand hills, and shallow sand range sites are most susceptible to wind erosion, however, sites with good vegetative cover and density are less susceptible to the hazards of erosion.

In the ES area, approximately 58 percent (922,000 acres) is in the very high soil blowing hazard groupings, approximately 38 percent (597,000 acres) is in the high soil blowing hazard grouping, 3 percent (41,000 acres) is in the moderate soil blowing hazard group, and approximately 1 percent (23,000 acres) is in the slight soil blowing hazard group. Appendix 2, Table B-2 has a listing of wind erodibility groups for each soil series.

Water Erosion

Soil texture, soil slope, and ground cover affect the susceptibility of a soil to water erosion. Surface texture determines if the soil surface will be easily sealed by rain. Clay surfaces would tend to seal more quickly, often causing high rates of run-off. Coarse-textured soils do not seal as easily.

Surface permeability and the soil's capacity for holding water also influence erosion, with these features determining how much water could be absorbed before run-off begins. Another direct effect would be the angle of slope. Steep soils are unstable and erode more rapidly, due to increased velocity of surface run-off. Coarse fragments on the surface also affect erosion because they act as "armor," protecting the soil from both the impact of raindrops and of run-off. Vegetative litter acts in much the same manner.

Erosion classes are based on the Pacific Southwest Interagency Committee's (PSIAC) method (1968) for estimating erosion. For this environmental statement, they are listed in Appendix 2, Table B-5. Methodology is discussed in Appendix 2. Erosion classes for each range site are listed in Appendix 2, Table B-4.

Sediment yield figures given in Appendix 2, Tables B-2, B-4, and B-5 are relative values only and were not developed as a result of actual measurement of sediment yield. They indicate relative ranges of values and are considered valid in identifying trends.

Sandy plains, loamy sand, and deep sand range sites are examples of sites which are classed as being in slight danger of water erosion. They are in areas which have very little slope and which have sandy surfaces. Range sites with moderate slopes and with loam or clay loam soil surfaces are in the moderate erosion class. Gravelly range sites are an example of this class. The critical erosion class consists of areas with steep or very steep slopes which produce large amounts of run-off. The gyp hills and breaks range sites are typical of this erosion class.

Overall, of the four water erosion classes (slight, moderate, critical, and stable), 75 percent (1,202,000 acres) is in the slight classification. Approximately 23 percent (367,000 acres) is rated as moderate and approximately 1 percent (15,000 acres) is listed as critical. Less than 1 percent (10,000 acres) would be considered as being in the stable erosion class.

AIR QUALITY

In general, air quality is good in the ES area. Summer winds flow from the southeast becoming southwesterly in late winter and early spring. Winds in the Carlsbad area are typical, averaging 10 mph in the fall and 16 mph in the spring. Peak velocities reach 50 mph. This combination gives the area some of the best conditions in the nation for a rapid dispersion of pollutants.

There are occasional winter inversions which can best be seen by observing the emission plume patterns of potash mines in east Eddy and Lea Counties. However, these inversions are of short duration because of storm fronts and of unstable cold air masses moving through the area. Summer inversions last longer and convection columns can occur at any time or place, particularly in the summer when solar radiation destabilizes the air close to the ground, producing air turbulence.

A number of natural conditions and activities can produce air pollution. However, the major causes in this area are the potash refineries (Environmental Analysis Record (EAR) Potash Leasing in New Mexico, BLM, 1975, p.II-44). They emit particles of potassium chloride, potassium oxide, silicon dioxide, and water vapor into the atmosphere. BLM estimates indicated that there was a daily discharge of 55 tons of airborne pollution from the potash industry in 1970.

WATER USE

Drinking water for livestock is an important onsite use for water in the east Roswell area. BLM water developments for both wildlife and livestock (primarily wells, storage tanks, drinking troughs, and pipelines) are essential within the ES area, providing a dependable yearlong source of water. Some recreational use is also made of these water sources. Table 2-4 summarizes all water usage in the ES area and compares its uses on the public lands.

TABLE 2-4
WATER USES
(Acre - Feet per Year)
Source: Sorensen, Earl F. 1977. Water Use by Categories in
New Mexico Counties and River Basins, and Irrigated
and Dry Cropland Acreage in 1975,
in: Technical Report 41, New Mexico State Engineer,
Santa Fe.

	Private and State Lands			Public Lands		
Use	Surface	Ground	Total	Surface	Ground	Total
Urban	0	9,966	9,966	0	0	0
Rural	0	715	715	0	0	0
Irrigated Agriculture	11,732	208,402	220,134	0	0	0
Manufacturing	0	555	555	0	0	0
Minerals	0	24,919	24,919	0	0	0
Livestock*	1,872	1,618	3,490	38	275	313
Power	0	13,876	13,876	0	0	0
Fish and Wildlife	4,929	628	5,557	3	5	8
Recreation	Unknown	Unknown		0	1	1
Total	18,533	260,679	279,212	41	281	322

This report is available from the Unit Resource Analysis files, Roswell District Office (BLM).

*Based on the average consumption of 12 gallons of water per day, per animal.

GROUND WATER QUALITY

The four major aquifers being tapped for wells in this area are the Rustler Formation, Triassic rocks, the Ogallala aquifer, and Alluvium (Geohydrology Associates 1978, East Roswell area hydrologic data).

The 1978 report and other available data states that water-bearing formations in much of Chaves and Eddy Counties contain soluable evaporite deposits with the principal salts being halite and gypsum.

Each of the four aquifers are characterized by different types of water and there is abundant evidence of these waters mixing between aquifers. Rustler Formation samples primarily contain calcium sulfate, but some also contained sodium chloride. The total mineralization of this formation's water generally exceeds 1,500 milligrams per liter (mg/l) total dissolved solids (TDS). However, samples in excess of 5,000 are not common.

Distribution of cations (positively-charged ions) in water samples from Triassic rocks are somewhat unusual with calcium, magnesium, and sodium present in nearly equal proportions. The principal anion (negatively-charged ion) is sulfate. Total mineralization in samples from Triassic rocks is generally lower than from those of the Rustler, with most samples containing more than 1,000 mg/l TDS.

The least mineralized water samples in the area came from the Ogallala aquifer. These samples were basically a calcium-sodium-bicarbonate type of water with carbonate-bicarbonate, sulfate, and chloride ions present in nearly equal proportions. The total dissolved solids are usually less than 1,000 mg/l.

Samples from alluvial aquifers show varying degrees of mineralization, because much of the water in these aquifers is derived from surface water sources (such as the Pecos River) or from highly mineralized springs.

Analysis of water samples for the ES area indicates that very little of the ground water meets the water quality standards for drinking water as set by the New Mexico State Environmental Improvement Division (EID), due to the high totals of dissolved solids and the amount of sulfates. Based on these EIA criteria, fully 75 percent of the ground water in the ES area is normally undesirable for human consumption.

In general, water throughout most of the area exceeds the recommended limits for maximum concentrations set by the EID. Nevertheless, when consumed in small to moderate quantities, this water would not be injurious to humans, livestock, or wildlife.

SURFACE WATER PRODUCTION

Limited surface water, erratic precipitation patterns resulting in occasional drought, and only one live stream (the Pecos River) are major problems affecting the surface water resources of this ES area. Approximately 20 percent of the area's 700 square miles is included in an integrated drainage basin (a clearly defined drainage channel tributary to a larger perennial stream, or displaying evidence of periodic streamflow into closed basins). Ninety-five percent of the area studied for this ES is in a closed basin, indicating little or no surface drainage and resulting in a lack of run-off data. The ES area's western edge is a narrow belt dissected by short arroyos draining into the Pecos River, with none draining more than a few square miles.

Depressions (playas) are a common surface feature within the ES area with most having bottom areas of 10 acres or less (about 60 percent) or 10 to 50 acres (about 35 percent). There are about 2,000 playas generally not more than 40 feet below mean ground level.

Theoretically, approximately 1.6 million acre-feet of rainfall would be received annually upon the area's public lands (based on an annual rainfall of 12 inches). Intense thunderstorms during July and August contribute most of this rainfall and the resultant run-off. The ES area's sandy soils and generally slight slopes result in rapid water infiltration and reduce run-off potential. Based on data from tributaries on the west side of the Pecos River, less than 1.5 percent of the annual rainfall could be expected to appear as run-off. Only about 1,200 acre feet are contributed to the Pecos River by short tributaries on its east side, the rest is retained in the closed basin. Some run-off is stored in manmade ponds and in natural karst depressions (playas). This water is normally consumed by livestock or wildlife, although evaporation accounts for major losses. According to BLM records, these playas and stock ponds can store a total of 104,422 acre feet.

SURFACE WATER QUALITY

Because there has been no continuous water sampling of surface water in this ES area, the only water quality information available is based on one sample (Hydrologic Data, East Roswell ES Area, Geohydrology Associates 1978). This sample is from a stock pond in Long Arroyo (Sec. 13, T. 14 S., R. 27 E.).

The Long Arroyo water sample would be suitable for human or livestock consumption and for irrigation. It is typical of surface water run-off for the area. All constituents are below the recommended maximum standards set by the Environmental Protection Agency (Primary Drinking Water Standards and Quality Criteria for Water, U. S. EPA, Washington, D. C. 1976).

WILDLIFE

The East Roswell ES Area provides eight distinct wildlife habitats ranging from the Pecos River on the western boundary to active duneland in the east. A list of animals associated with each habitat type is found in Listings, pages 1-8. Included in this list are three federally-designated endangered species, eight State Endangered Group I, and 24 State Endangered Group II animals. Classified wildlife, the acres of available habitat, and habitat condition are listed in Appendix 2, Table B-6.

Other wildlife which would be affected by the proposed action are 35 game animals and furbearers, one unique species, (Appendix 2, Table B-7) and 22 birds included in the Audubon Society's Blue List for 1978 (Appendix 2, Table B-8).

Definitions of the various classified categories, unique species and "blue listed" birds are given in the respective tables.

Aquatic and terrestrial wildlife species will be discussed in taxonomic order, beginning with vertebrates and ending with invertebrates.

Fish, Amphibians, and Reptiles

The Pecos River and the Salt Lake near Loving support 44 species of fish (BLM District files). Of this group, 25 species are common or "rough" fish such as the sand shiner and longnose dace. Many are prey species for eleven gamefish including the channel catfish and largemouth bass. The remaining ten species are considered by the New Mexico Department of Game and Fish (NMDG&F) as endangered (See Endangered section).

The Pecos River provides most of the ES area's aquatic habitat. This river is a low quality, warm water fishery throughout most of its length.

Thirteen species of amphibians are found in the ES area (Stebbins, 1954) however, only three species of amphibians are wholly aquatic: the tiger salamander, leopard frog, and bullfrog. Other toad species, such as the Great Plains, green and desert, breed in intermittent ponds, stock reservoirs, and permanent water courses. At other times, they may wander far from breeding places where they are found in rock fissures, rodent burrows, and gopher holes. Although all amphibian habitats are fairly well known, at what point habitats become unsuitable is not understood. A literature search verifies this fact since there are no broad ecological studies available.

Field guides (Stebbins 1954; Stebbins 1966), reports (West 1975; Bernard and Brown 1977), and studies (Wolfe, 1977) list between 40 and 57 species of reptiles within the ES area. Seven turtles, one gecko, thirteen lizards, seven whiptails, and 29 snakes are included (BLM District files). All habitats are occupied, but specific animal occupancy and population data is known for only three of the area's eight habitats. A study by Eastern New Mexico University (Wolfe, 1971) showed that dirt tanks supported tiger salamanders, green toads, and yellow mud turtles. A land turtle, the western box turtle was found in all habitats inventoried (shinnery oak-mesquite, mesquite grassland, and creosote grassland) as did the side-blotched lizard and western whiptail. Several snakes also exist in these habitats. The western hognose snake, coachwhip, gopher snake, and western rattlesnake were common. The night snake, western diamondback rattlesnake and massasuga were less common.

Birds

Birds are the most widely represented vertebrate group. Approximately 300 species are found within 17 orders and 51 different families. Various bird species are the wildlife most often named on the federal and state endangered lists (Appendix 2, Table B-6).

Aquatic birds use habitat primarily along the Pecos River. Use is largely seasonal with the highest numbers noted during the spring and fall migrations. These species rely on fish, amphibians, snails, and aquatic vegetation for food. Only the great blue heron and green heron nest in the saltcedar bands along the Pecos (Ligon, 1961).

Waterfowl may be found utilizing all types of local aquatic habitat. The Pecos River, Lake McMillan, and Lake Avalon seasonally attract large numbers of waterfowl, cranes, shorebirds, and swallows. The weedier edges of these bodies of water, together with flooded playas, support marsh wrens, redwing blackbirds, swamp sparrows, fox sparrows, and Lincoln sparrows.

Dirt tanks and flooded playas are heavily used by migrant waterfowl as resting areas. Most dirt tanks and playas are capable of producing aquatic and emergent vegetation when conditions are wet enough, however, cattle use of these areas has left them devoid of vegetation except for mats of buffalograss in some playas. Playa lakes receiving light grazing pressure contain sedges, barnyard grass, and canarygrass, all important food plants for waterfowl (Martin, et al., 1951). Breeding takes place among lingering summer shovelers, mallards, and pintails. Dirt tanks and playas are not used as breeding sites due to a lack of emergent plants. Observations in west Texas show that playas are readily used by breeding ducks when the growth of emergent vegetation is encouraged.

The raptors, or birds of prey, are among the most obvious form of wildlife in the ES area. Golden eagles, red-tailed hawks and rough-legged hawks are common winter residents with Swainson's hawks and redtails common all summer. Great-horned owls are common yearlong residents, nesting on windmills and in groves of cottonwoods, hackberry, and soapberry trees. Large saltcedars are also used along the Pecos River (BLM inventory results).

Intensive inventories during the spring of 1979 revealed that there were 32 active leks (booming grounds) of the lesser prairie chicken. Approximately 336 males were observed in display. Booming grounds are abandoned oil pads or shortgrass outcrops within the shinnery oak community. Nesting habitat is critical since only relatively high quality tall grass areas are used. At least 57 percent of the plant composition of potential nest sites must be grass with bluestems making up 25 percent of all grass (New Mexico State University, 1979). The best nesting cover is found in the Mathers Natural Area, a shinnery oak-grassland which has been protected from grazing for at least 50 years.

Another game bird, the scaled quail, is abundant in this area. This species is found in the transition zone between grassland and shrubland habitats (Brown, 1978). Mesquite grassland supports most quail, followed by mixed desert shrub, and shinnery oak (BLM estimate). Areas heavily used by livestock are characterized by mesquite and snakeweed. Livestock range is favored by scaled quail since mesquite and snakeweed are a major portion of their winter diets (Davis, et al., 1975). Carrying capacity, or the maximum numbers of quail which can survive during the hardest time of year, is established during the winter (Errington, 1934).

Mourning doves (game birds) use the ES area extensively, leaving only during the colder winter months. They nest readily in all habitats except creosote and shinnery oak areas. The New Mexico Department of

Game and Fish considers the saltcedar zone along the Pecos as an important nesting habitat. Mourning doves utilize mesquite trees, hackberries, crucifixion thorn, and littleleaf sumac. They also nest on the ground in tobosa grass swales. Studies show that there is no critical overlap in diets between scaled quail and mourning doves and ranges may be shared without competition (Griffing and Davis, 1976).

Birds typical of shortgrass habitats or lightly infested mesquite grasslands are few in number compared to mesquite and mixed desert shrub habitats. These species include horned larks, meadow larks, lark buntings, lark sparrows, and Cassin's sparrows.

Desert shrub and mesquite habitats typical of poor range condition (Gay, 1965) contain more species of birds than even well-managed grasslands (Beckwith 1954, Johnston and Odum 1956, Mitchell 1961). Pyrrhuloxias, loggerhead shrikes, and western kingbirds are representative of the 68 species found in shrub-invaded areas.

Breeding densities of shortgrass species are not available for the ES area, however, on other southern New Mexico desert grasslands, a total of ten species comprise an average of 69 breeding pairs per 100 acres (Russell, et al., 1972). In the area's southern desert shrub, breeding pairs averaged 10 - 100 pairs per 100 acres, depending on the site (Dixon 1959, Raitt and Maize 1968). Although shrub invasion has increased the number of breeding species in grasslands (Johnston and Odum, 1956), particularly in the ES area, this change has occurred at the expense of true grassland birds which are dependent on good range condition for abundant seed crops (Raitt and Pimm, 1924).

The demands of breeding species for protein dictates a diet of insects, particularly grasshoppers (Fretwell, 1972), but winter residents such as the pyrrhuloxia, green-tailed towhee, savannah sparrow, grasshopper sparrow, Baird's sparrow, clay-colored sparrow, McCown's longspur and chestnut-collared longspur require seeds during winter (Weins, 1974). An abundance of winter seed crops probably plays the major role in the extent of winter mortality, possibly the principal regulator of population size, even more than the variable success of breeding (Fretwell, 1972).

During migration, the flycatchers, vireos, and wood warblers are very dependent on scattered groves of soapberry and hackberry trees around playas and sinks. Cottonwoods along the Pecos River are the most important riparian tree for foraging birds. Livestock grazing of tree groves has eliminated grasses and other vegetative strata beneath tree canopies which were formerly used as food by migrating birds. Light use of an area by livestock encourages grasses and trees which harbor more insects for migrant warblers (BLM observation). Isolated tree groves and riparian trees, in particular, are very important to migrating birds in the southwest with ten times as many migrants found on riparian plots than adjacent nonriparian zones (Stevens, et al., 1977).

Saltcedar is much less important to migrant and resident birds than is other riparian vegetation (Anderson, et al., 1977), however, if it is the only form of tree available, it probably will be used. This is the case along most of the length of the Pecos River.

The species of birds occupying eight different habitats are found in Listings, "Major Habitat Types and Related Animal Species."

Mammals

A complete list of mammals using ES area habitats is found in Listings, "Major Habitat Types and Related Animal Species." Game animals and furbearers are found in Appendix 2, Table B-7.

Seventeen species of bats have been documented in this area. Sightings of most bats have occurred along the Pecos River (Findlay, et al., 1975) indicating that the river valley is a major migration route. Use of the Pecos River is probably tied to the greater insect production (food source) and availability of roost sites. The suitability of bat habitat is related to these two factors. Insect production is related to vegetative diversity and height which would define niches, or differing habitats suitable for occupancy by different species (Balda, 1975). Water quality would, in turn, affect insect productivity by influencing niches.

Raccoons, long-tailed weasels, beavers, and muskrats are furbearers which depend on the Pecos River and scattered stock tanks for habitat. Raccoons are probably more restricted to the river valley and dirt tanks in drainages. Although the long-tailed weasel is found in a variety of habitats, observations by BLM biologists have linked it closely with riparian areas and other aquatic habitats. Beaver and muskrat activity is infrequently observed in the northern sections of the Pecos.

Coyotes utilize all habitats in the ES area. Population densities may vary from one to three per square mile depending on topography and availability of prey (U. S. Fish and Wildlife Service estimate). Denning takes place along the Caprock, Pecos River, and in the sand country along the eastern part of the ES area. Coyotes are omnivorous, however, they depend primarily on small mammals and rabbits (Martin, et al., 1971). Dependence on rodents is related to studies which show coyote populations rise or fall, dependent upon fluctuations of rodent populations (Advisory Committee on Predator Control, 1972).

The bobcat population is also decreasing because of increased trapping efforts, according to NMDG&F. All habitats are utilized with rougher cliffs, the Pecos River, and the sand country used for denning.

Thirty-nine species of rodents are found in the ES area. Considered as a whole, rodents are in greater numbers with more diverse species in well-managed shortgrass areas (Olendorff and Stoddart, 1973), however, on ranges dominated by black grama, rodent densities can average as low as 0.64 per acre (Wood, 1969). Mixed desert shrub areas may average as high as 2.63 rodents per acre (Wood, 1969).

Rodent studies in the area (Wolfe, 1977) show small mammal habitat preference and population parameters in certain habitat types. Spotted ground squirrels were found in sandy habitats, both shinnery and mesquite, and averaged two animals per acre. Plains pocket mice and Ord's kangaroo rats also preferred sandy habitats and averaged six and eight animals per acre. Merriam's kangaroo rat and desert pocket mouse preferred creosote and mesquite grasslands, but population data was not taken.

Between 350 and 400 black-tailed prairie dogs are found in five towns in the ES area. Their range is not as extensive as in the past, due to control programs, but present towns are apparently not in serious conflict with grazing programs.

New Mexico Department of Game and Fish (NMDG&F) has removed the *arizonensis* subspecies of the black-tailed prairie dog from their endangered species, Group II, list following surveys which show that this subspecies does not exist in ES area or state.

Black-tailed jackrabbits and desert cottontails average approximately one animal per acre in late summer (Wolfe, 1977, and BLM estimates) on moderate to heavily grazed areas. Brushy areas with mesquite and javelina bush could be expected to have more rabbits of both species than would a well-managed grassland (Vorhies and Taylor 1933, Stoddart and Smith 1948). On shortgrass ranges, both species are present, but jackrabbits are usually found in greater numbers, particularly with light to moderate summer grazing (Flinders and Hansen, 1975).

Mule deer are widely scattered, living primarily in the saltcedar stands along the Pecos River and associated draws and in shinnery oak habitat. Allotments 6020, 7022, 7031, 7032, 7033, 7034, 7036, and 7037 contain important yearlong habitat for mule deer. Populations appear to be increasing, however, population density is still light. Small areas have peak population of one to three animals per section. Sex and age ratios collected by the Department of Game and Fish in 1975 indicate that 40 bucks per 100 does will produce a 70 percent fawn crop. Overall population estimates published in the NMDG&F's 1978 comprehensive plan indicate that 997 mule deer live within the ES area.

Browse on semidesert rangeland is deficient in phosphorus and of low quality. This deficiency affects, growth, reproduction, and well-being of mule deer using this habitat (Church 1971, Short 1977). This game animal uses available forage with grass being most important in spring and with mesquite beans being favored in summer. Proportionally, more cactus is eaten by mule deer than is other browse in an area. Mule deer in shinnery oak habitats appear heavier-bodied with broader and larger antlers. This is probably due to the better nutritional value of acorns (Duvendeck, 1962). Use of shinnery acorns may make up 11 percent of the diet on shinnery ranges (Darr and Klebenow, 1975).

Competition between cattle and mule deer may be a limiting factor on mule deer populations on semidesert rangeland (Short, 1977). The low productivity of these ranges (Carothers and Johnson, 1975), causes cattle diets to become extremely varied with shrubs often making up more than one-half in certain seasons on southern New Mexico ranges (Rosiere, et al., 1975). Spring diets are similar for both animals when grasses are available (Mackie, 1978).

Approximately 1,142 antelope are native to the east Roswell area. They average one to three animals per 1,000 acres, depending on habitat. Male, female, and fawn ratios are three bucks per ten does, producing about five fawns each season (NMDG&F estimates).

Water distribution for antelope is adequate over most of the occupied habitat, however, due to pipelines being shut off when livestock are removed from pastures, much habitat is unusable because water is not consistently available. Many watering troughs also exceed the recommended 18-inch maximum height which would allow access for antelope.

Antelope diets consist mainly of forbs and browse throughout most of their range (Russell, 1964) but availability affects the ratios consumed in spring and summer with higher quantities of browse taken in winter months when precipitation is low.

On antelope range adjacent to the ES area, Russell (1964) found that forbs made up over 90 percent of the diet in all four seasons and Stoddart and Smith (1955) found that, although browse made up as much as 30 percent of the diet of antelope on southern ranges, forbs were still of greater importance.

Competition with cattle occurs in the early spring when forbs are selected by both animals before grass plants green up. Generally, the presence of both antelope and cattle on ranges can be mutually advantageous since antelope select forbs which are major competitors with grass for soil moisture (Terwillinger 1946).

Aquatic Invertebrates

Only seven species of aquatic insects have been documented in the ES area out of a probable list of hundreds. These are the most common, or obvious and larger forms including damsel flies, dragon flies, mosquitos, water striders, backswimmers, water boatmen, and giant water bugs. The effects of grazing on aquatic invertebrates have not been documented although the presence of aquatic insects and their density are probably functions of water quality, stream topography, aquatic vegetation, and the amount of dead material (Platt, 1978) entering aquatic habitats as they are influenced by grazing.

No studies concerning aquatic snails have been made in New Mexico. According to Pratt (1973), any desert spring or watercourse has a potential for containing its own endemic species of snail of the family Hydrobiidae.

Terrestrial Invertebrates

The most complete list of insects occurring in the ES area was compiled by Wolfe (1977) for the shinnery oak-mesquite habitat. Nine orders are represented by 91 families. Of this group, four families are predatory, preying on other insects. Several species were plant-specific, e.g., a walkingstick found exclusively on sand sage and a grasshopper species found only on mesquite.

Vegetation plays an important role in both distribution and numbers of arthropods beyond the basic provision of a food source. Vegetation height, density, and composition all affect arthropod density. A number of studies have recognized that varying levels of livestock grazing can be either a detriment or benefit to various arthropod species. Pepper (1955) reported that, almost without exception, high population densities of grasshoppers occur in areas with excessive livestock grazing, or together with a combination of heavy grazing and dry weather. Overgrazing causes many insect species to decline or disappear, but it can enable grasshoppers to increase enormously.

Studies on the International Biological Program Grassland Biome (1971) revealed a consistently greater number of arthropods throughout the season in the permanently ungrazed plots. These data are consistent with those of Morris (1967) who found that most taxonomic groups that he had sampled were most commonly found in areas left ungrazed for two to three years. Lightly-grazed plots supported greater numbers of arthropods than did moderately or heavily grazed plots; light grazing of pastures resulted in a build-up of Homoptera (plant-sucking insects) which was maintained throughout the season; and ants were found in smallest numbers in the heavily grazed pasture (Lavinge, et al., 1972). In addition, arthropods are known to provide food for the area's insectivores such as kingbirds, flycatchers, grasshopper mice, bats, and shrews, as well as many other birds and mammals which are not primarily insectivores.

ENDANGERED, THREATENED, AND/OR BLUE-LISTED WILDLIFE:

Endangered Fish

Present habitat conditions best explain why those classified State Endangered Group I and II fishes are listed in their current status (See Appendix 2, Table B-6). Pools and riffles which are the two main habitats of river fishes are adversely affected by turbidity, caused by continuing use by cattle of the Pecos River floodplain and adjacent watersheds. Fish such as the green-throat darter (State Endangered Group I) (New Mexico Dept. of Game and Fish, 1978) which depend on pool habitat and riffle dwellers such as the gray redhorse (State Endangered Group I), blue sucker, and Mexican tetra (State Endangered Group II) require stable habitat conditions. Turbidity and its effect on bottom structure, flow, vegetation, and visibility make both of these habitats unsuitable (New Mexico Department of Game and Fish, 1978).

Two amphibian species are considered endangered by the State of New Mexico, the Eastern barking frog and Blanchard's cricket frog. There are no known Eastern barking frog populations on public lands, although suitable habitat, in the form of limestone outcrops, is available along the Pecos River. Blanchard's cricket frog is more widely distributed, usually found in well-vegetated pools along the Pecos River.

The highest numbers of amphibians are found around water in the spring and summer during breeding activity. (See, Appendix 2, Table B-6 for animals living in riparian habitats.)

Endangered Reptiles

Six species of reptiles are considered endangered by NMDG&F. Among the endangered group, the blotched plain-bellied water snake, the Pecos western ribbon snake, and the Texas slider turtle have peripheral range extensions into New Mexico and this ES area where their habitat is primarily riparian (Hubbard, et al., 1978). Grazing activity and saltcedar control could jeopardize these species along the Pecos River. Due to low population levels, two other endangered reptiles are also listed although they are at the edge of their range in New Mexico. These include the mottled rock rattlesnake and the Trans-Pecos rat snake.

The only endangered reptile which is dependent on habitat found exclusively in the ES area and the western parts of Texas is the sandune sagebrush lizard. A subspecies of the common sagebrush lizard, this reptile depends on active dunelands found in the Mescalero Sands of southern Chaves and Northern Eddy Counties. Dune stabilization is the greatest threat to this species (Degenhardt and Jones, 1972).

Endangered Birds

The southern bald eagle is the only federally endangered bird that would normally use ES area aquatic or riparian zones. Sightings in the area are uncommon, probably due to the low quality of Pecos River fisheries.

The olivaceous cormorant and little blue heron are in Endangered Group I on New Mexico's list due to historically low numbers and limited nesting sites in the Pecos River valley (Hubbard, et al., 1978).

The osprey and least tern (State Endangered Group II) are both dependent on aquatic habitats. The osprey is exclusively dependent on the Pecos River and is a regular spring and fall visitor although, historically, numbers have been low (Hubbard, et al., 1978). The least tern is an occasional migrant in Eddy and Lea Counties, but spends summers at the Bitterlakes National Wildlife Refuge (BLNWR). In other areas, habitat exists in the form of sand bars and spits along the Pecos River and wide alkali flats of the Salt Lake near Loving. These areas may be suitable for habitat although nesting has not been detected or recorded (Hubbard, et al., 1978).

The Audubon Society has included seven aquatic birds found in the ES area on their 1978 Blue List which studies birds with disturbing population declines. These species are: western grebe, black-crowned night heron, canvasback duck, osprey, snowy plover, least tern, and black tern. All use the area during migration. The least tern is a possible nester.

One terrestrial shorebird which is dependent on grassland habitat, is in serious trouble, both locally and throughout its range. The upland plover, or sandpiper, is on the 1978 Blue List due to fewer sightings and to breeding habitat disturbance. These birds once bred in the eastern part of the ES area, but no recent nesting has been documented. Shortgrass habitat and grassy drainages are available for nesters but specific efforts to locate breeding upland sandpipers have not been made. Migrant birds are regularly seen in alfalfa fields in the river valley with occasional groups having been seen in shinnery oak areas by BLM personnel.

The Mississippi kite (State Endangered Group II) reaches the western limits of its range in the southwest. Hubbard, et al. (1978), lists this little raptor as a local summer resident in the Pecos River valley, however, no nesting pairs have been documented although habitat in cottonwood trees exists.

The sharp-shinned hawk and Cooper's hawk are on the 1978 Blue List although the Cooper's hawk appears to be doing well in the southwest. These birds are most noticeable in the winter where they are seen foraging along the Pecos River, among tree groves, and along mesquite infested drainages. Several birds are flushed every summer from woody habitat but no nests have been located. Marsh hawks (Blue List) are common winter raptors, but do not breed in the ES area due to a lack of marshy vegetation along the Pecos River. Occasional summer individuals are seen in shinnery oak-mesquite habitat, but no nests have been located.

Ligon (1961) noted that ferruginous hawks (Blue List) once nested in the "sandhill country" of the ES area though no nesting activity has been noted in recent times. Winter birds are usually noticeable around prairie dog towns, however, ferruginous hawks seem equally well distributed throughout shortgrass and shinnery oak habitats. Ligon (1961) reported on the unusual numbers of melanistic (dark-plumaged) birds in New Mexico and roadside surveys by the BLM biologist show that up to 28 percent of the ferruginous hawks observed in the ES area were dark-phased birds.

Swainson's hawk is the raptor which most commonly breeds in the ES area although it is on Audubon Society's Blue List as decreasing throughout its range. Nesting hawks utilize mesquite, soapberry, saltcedar, and hackberries in September when juveniles and adults are still in the area prior to migration south. As many as one bird per square mile have been seen in the shinnery oak-mesquite habitat in Eddy and Lea Counties in mid-September. During the time of the census, black-tailed jackrabbits, a principal food, averaged one rabbit per acre. Their presence probably accounts for the large number of hawks (BLM estimates).

The Harris Hawk (Blue List) is a common nester in its range within the ES area extending from Artesia east and south. Nests are usually high in soapberries, hackberries, or elms, although nests have been found by BLM biologists in 7 to 10-foot mesquite trees. BLM inventories of nesting raptors show that nestings of Harris' hawk in the ES area are very productive, often hatching and fledging three birds per nest. This success is due to the usual attendance of three adults at the nest, a common trait for this species (Mader, 1957). Examination of individual trees and tree groves where Harris' hawks nest shows that these trees are heavily used by cattle and little seedling establishment is taking place to replace older trees.

Migratory peregine falcons (Federal Endangered, State Endangered Group I) are found statewide, though the numbers observed have decreased significantly (Hubbard, et al., 1978). Fewer than a half dozen sightings have been recorded in recent years. Birds are usually observed once and then are never seen again. No suitable breeding sites exist.

The prairie falcon (Blue List) appears to be doing well in the southwest; therefore, observers favor its deletion from the 1978 Blue List. Sightings are common and are most frequently associated with shortgrass range or mesquite-invaded grasslands during winter months. No breeding takes place in the area due to a lack of cliff areas where nests would be inaccessible to predators and disturbance. This falcon is less likely to be affected by pesticides than is the peregine falcon because of its limited migratory activity and its diet of small mammals (Bond, 1972).

The merlin (pigeonhawk) is on Audubon Society's Blue List for 1978 because of population declines. Only a few winter migrants have been seen in the ES area which agrees with Ligon's (1961) observation that few of these birds are seen in New Mexico.

The barn owl (Blue List) is an uncommon yearlong resident in the ES area. Birds are usually seen in saltcedar thickets along the Pecos River and at dirt tanks with saltcedar, hackberry, or chinese elm trees. Barn owls nest in the state (Ligon, 1961) but none have been seen during inventories of raptor nestings in the ES area.

Burrowing owls (Blue List) are commonly found all year in the ES area habitats. Prairie dog towns, gopher holes, packrat nests, sand dunes, and caliche pits are utilized for nests and occupied during winter. No correlation seems evident between range condition and the existence of burrowing owls. Rather, owls appear to use any available burrow or hole regardless of location.

Short-eared owls (Blue List) are locally common on grasslands in good range condition. They are usually seen above shortgrass pastures in late afternoon or can be flushed from mixed desert shrub pockets within grassy pastures. In February, these owls are common on the ecotones between shinnery oak and mesquite grasslands. They also favor areas where brush has been sprayed and forage has been lightly used. No nesting has been recorded for the ES area or state (Ligon, 1961).

Red-headed woodpeckers (State Endangered Group II) nest exclusively in riparian habitat (Hubbard, et al., 1978) Cottonwoods are favored for nesting but none have been observed on public land.

The yellow-billed cuckoo (Blue List) is a breeding summer resident found all along the Pecos Valley. It probably nests in cottonwoods in Chaves County and possibly in saltcedars along the river.

The Bell's vireo (State Endangered Group II, Blue List) is stable within its New Mexico habitat although it has declined in other parts of the southwest (Hubbard, et al., 1978). Loss of riparian vegetation is a major threat to this species in the ES area since Bell's vireo depends on cottonwoods and mesquite along the river. The extent that it uses saltcedar is unclear in New Mexico although in Arizona declines were noted before saltcedar invaded. Saltcedar was unimportant to the Bell's vireo once it became established (Anderson, et. al., 1977).

The Yellow-breasted chat (Blue List) is a resident of riparian bottomlands along the Pecos River, nesting in bushes like saltbush, since its favored nesting grounds are much farther west (Ligon, 1961).

Baird's sparrow (State Endangered Group II) relies on healthy winter grasslands with abundant seed crops (Hubbard, et al., 1978). This is not a common species in the ES area due to problems on breeding grounds further north and to winter habitat degradation.

The ES area is part of the major wintering grounds of McCown's longspur (State Endangered Group II). It is most often seen around stock tanks with chestnut-collared longspurs and horned larks. Improper livestock use of shortgrass areas is a limiting factor on winter populations of McCown's longspur (Hubbard, et al., 1978).

UNIQUE-PROTECTED WILDLIFE

A remnant herd of approximately ten white-tailed deer (unique) occupy the Mescalero Sands South Dune Area A (Outstanding Natural Area) which is closed to livestock use. Several habitat factors make this area unique. Shinnery oak plants are usually tall, averaging four feet high (shinnery oak normally is only 18-24 inches high). Cottonwoods and willow are also found in this area and nowhere else. Limiting factors on the population are livestock grazing and expanding mule deer herds in adjacent areas. Diets are similar to mule deer preferences with dependence on grass and forbs in the spring and shinnery oak in the winter.

CULTURAL RESOURCES

Data developed for Step 3, Unit Resource Analysis (URA) of the East Chaves, East Eddy, and Lea Planning Units are the basis for cultural resource information within this document. These data are on file in BLM's Roswell District Office. It is anticipated that the Class I Survey Overview of the cultural resources in the Roswell District will be completed in mid-October 1979. This document should contain more detailed information concerning the cultural affiliation of sites and site densities. Approximately 438 cultural resource sites have been recorded on public lands within the ES area. The number of sites recorded on public lands per allotment ranges from 0 to 68.

Discussion of Sites

These sites are important for their scientific potential or for their ability to provide information about the past. The traditional questions of "who, what, when, where, and why" are addressed in order to determine the prehistoric sequence. The first four questions must be adequately answered before "why," considered to be the most important question in archeology, can be addressed.

Archeologists have developed a number of field and laboratory techniques to provide answers. The identification of both the culture (who) and the time period (when) depend on a variety of dating techniques. Absolute dating techniques which are applicable to this area include obsidian hydration, thermoluminescence, and archeomagnetic (see glossary). A relative date for many sites can be determined from the pottery and diagnostic lithics. The internal stratification of a site can also be used to determine relative dates for components of a site.

Presently, there are several sources of cultural resource site deterioration. The majority of the cultural resource sites are exposed to either wind or water erosion. Due to the surficial nature of many of the archeological sites, they are subject to the effects of cattle trampling which includes the horizontal and vertical displacement of artifacts, and the breakage of artifacts. Additionally, the majority of the cultural resource sites are presently being pothunted to a certain extent.

Archeological Sites

The majority of the archeological sites are termed "open camp sites". This designation implies a surface scatter of cultural material and an absence of permanent structures. Under this general category, there are two subtypes: 1. lithic scatters, and 2. lithic and ceramic scatters. These site types are attributed to both the Archaic and Ceramic time periods. For additional information about the area's prehistoric sequence, refer to the Step 3 URA data for the East Chaves, East Eddy, and Lea Planning Units, in the BLM Roswell District Office.

Prehistoric house structures, rare in this area, have a greater depth of cultural material than open camp sites would have. These structures were inhabited during the Ceramic time period.

Due to the surficial nature of the majority of the archeological sites, they are highly susceptible to the movement of artifacts from a variety of sources.

Historic Sites

Within this ES, most historic sites are associated with military expeditions and explorations, minerals exploration, homesteading, and ranching.

National Register of Historic Places

Several cultural resource sites and districts located on public lands have been determined as eligible for, or nominated to the National Register of Historic Places. Mescalero Sands Archeological District and Pope's well and camp site have been nominated to the National Register. Laguna Plata Archeological District has been determined as eligible for nomination. In consultation with the State Historic Preservation

Officer (SHPO) on November 22, 1978, the following sites were thought to be eligible for the National Register of Historic Places: Maroon Cliffs Archeological District (77 sites); Potash Bull Wheel; AR 30-63; AR 30-6-73; AR 30-6-1034; and AR 30-6-1047 (MS-C-9) (See letter from Tom Merlan, SHPO, Appendix 5). The Keeper of the Register has determined these sites to be eligible for the National Register.

VISUAL RESOURCES

Landscape Character

A combination of topographic relief, vegetative cover, and manmade alterations (cultural modifications) determine the overall character of the ES area's landscape. The topographic relief is divided into three broad types, the Llano Estacado (Staked Plains), the Mescalero Sands, and the Pecos Valley. The Llano Estacado is generally a broad flat plain of gypsum hardlands along the eastern edge of the ES area. It has very little vertical relief, except for scattered sinkholes typical of karst regions. Vegetation consists mainly of short grasses with occasionally thick stands of mesquite. It is bounded on the west by the Mescalero Ridge. This ridge is a west-facing escarpment of reddish brown cliffs with an average vertical rise of approximately 100 feet.

The Mescalero Sands area consists of low, rolling hills composed of deep sand with occasional pockets of barren dunes. Vegetation consists mainly of shinnery oak and tall grasses.

The Pecos Valley forms the ES area's western boundary and consists of the Pecos River, together with a series of flood terraces on the west and a sheer escarpment, averaging 70 feet, on the east. Vegetation in the valley is typical of riparian zones. It includes dense stands of saltcedar and a few cottonwood groves.

Cultural modifications are scattered throughout this area and include fences, stock watering facilities, ranch buildings, oil and gas exploration and production facilities, highways, roads, potash refineries, pipelines, powerlines, railroads, and vegetative treatments. Depending on the attitude of the viewer, all these modifications may or may not be seen as visual intrusions. Most facilities associated with grazing are sufficiently scattered so as to reduce any significant harm to this scenic quality. The facilities, windmills in particular, are considered by some people to be symbols of the western lifestyle and to add a certain charm. In intensively developed oil and gas fields, the facilities give a busy appearance to the landscape and dominate the scene. Potash refineries also tend to dominate their localities.

The Visual Resource Management System

The ES area's landscape character has been inventoried and rated according to the Bureau's Visual Resource Management (VRM) system. There are two phases to this system: 1. determination of the VRM class, and 2. determination of contrast ratings for proposed projects. How contrast ratings are determined is discussed in Chapter 3. The visual or scenic value of an area indicates its VRM classification with visual quality, visual sensitivity, and visual distance being considered.

Visual quality is the relative level of natural beauty of a landscape, in terms of the form, line, color, and texture of the topography, vegetation, and structures. Visual quality is rated by using a matrix which considers landform, color, water, vegetation, uniqueness, and intrusions. Applying this matrix to a given area produces a numerical rating which is translated into "A" for high quality scenery; "B" for average scenery; or "C" for low quality scenery. Visual sensitivity is the measure of public concern for the visual quality of an area. Visual distance is that portion of a landscape which is visible from major travel routes or use areas. (For a discussion of Visual Resource management procedures, see BLM Manual, Sections 8411 and 8431.)

There are five possible classes in the VRM system. Class I primarily provides for natural ecological changes and is applied to primitive/wilderness areas, some natural areas, and other similar situations where management activities are to be restricted. Class II provides that changes in any of the basic elements (form, line, color, or texture) caused by a management activity should not be evident in the characteristic landscape. Class III provides that changes in the basic elements caused by a management activity may be evident in the characteristic landscape, but should remain subordinate to the existing visual quality. Class IV provides that changes in the basic elements may subordinate the original composition and character of the landscape but should reflect the original form, line, color, and texture. Class V is a temporary classification which indicates that change is needed. It is applied to areas where the natural character has been disturbed to the point where rehabilitation is needed.

Existing Situation

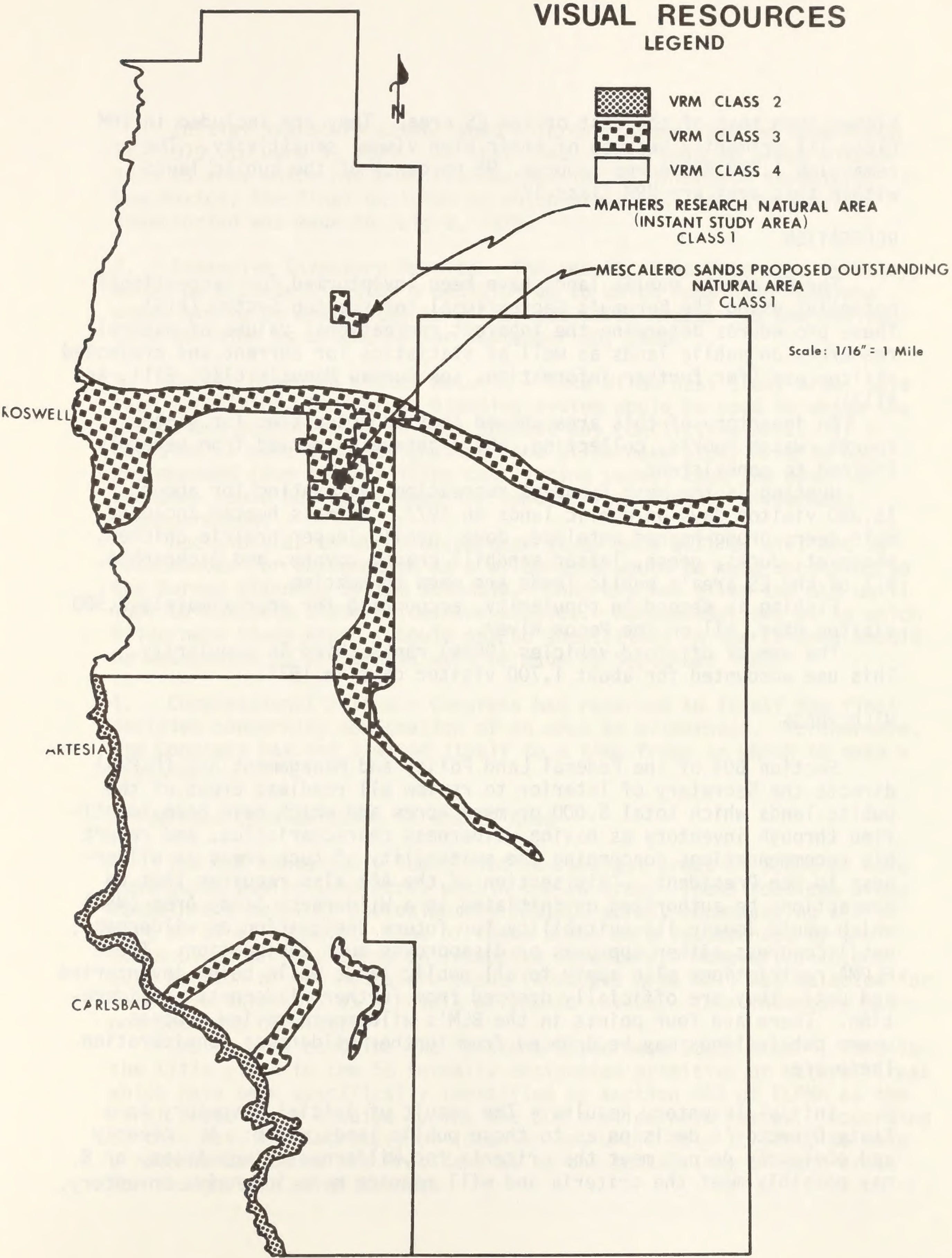
Four of the five possible VRM classes exist within this ES area (Map 2-1). The proposed Mathers Research Natural Area (RNA) and the proposed Mescalero Sands Outstanding Natural Area (ONA) are both in VRM Class I. The Mathers RNA has approximately 96 acres and the proposed Mescalero Sands ONA has approximately 1,885 acres for a total of about 1,976 acres (approx. 0.16 percent) of the public lands in VRM Class I.

The northern portion of Comanche Hill and the Pecos River basin from the Chaves/Eddy County line south are VRM Class II areas. They include approximately 10,400 acres (approx. 1 percent) of the public lands.

There are six VRM Class III areas totaling approximately 73,560 acres (approx. 5 percent) of the public lands within the ES area. These include U. S. Highways 70/380, 62/180 (N. M. 31), Mescalero Sands, Mescalero Ridge, Maroon Cliffs and Livingstone Ridge, and Laguna Gatuna (Map 2-1). The visual quality along the highways is not appreciably

MAP NO. 2-1

VISUAL RESOURCES



higher than that of the rest of the ES area. They are included in VRM Class III primarily because of their high visual sensitivity. The remaining 1,512,803 acres (approx. 95 percent) of the public lands within this area are VRM Class IV.

RECREATION

The ES area's public lands have been inventoried for recreational potential using the Bureau's Recreational Information System (RIS). These procedures determine the inherent recreational values of natural resources on public lands as well as statistics for current and projected visitor use (for further information, see Bureau Manuals 6110, 6111, and 6112).

An inventory of this area showed that opportunities for winter sports, water sports, collecting, and sightseeing varied from severely limited to nonexistent.

Hunting is the most frequent recreation, accounting for about 18,300 visitor days on public lands in 1977. Animals hunted included mule deer, prong-horned antelope, dove, quail, lesser prairie chicken, pheasant, ducks, geese, lesser sandhill crane, coyote, and jackrabbit. All of the ES area's public lands are open to hunting.

Fishing is second in popularity, accounting for approximately 2,500 visitor days, all on the Pecos River.

The use of off-road vehicles (ORVs) ranks third in popularity. This use accounted for about 1,700 visitor days in 1977.

WILDERNESS

Section 603 of the Federal Land Policy and Management Act (FLPMA) directs the Secretary of Interior to review all roadless areas of the public lands which total 5,000 or more acres and which have been identified through inventory as having wilderness characteristics, and report his recommendations concerning the suitability of such areas as wilderness to the President. This section of the Act also requires that no new actions be authorized or initiated in a Wilderness Study Area (WSA) which would impair its suitability for future designation as wilderness, until Congress either approves or disapproves such designation. These FLPMA restrictions also apply to all public lands while being inventoried and until they are officially dropped from further wilderness consideration. There are four points in the BLM's wilderness review process, where public lands may be dropped from further wilderness consideration. These are:

1. Initial Inventory Results - The result of initial inventory is a State Director's decision as to those public lands which: A. clearly and obviously do not meet the criteria for Wilderness Study Areas, or B. may possibly meet the criteria and will require more intensive inventory.

Initial inventory established a formal comment period from March 12, 1979, to June 9, 1979. At that time, there were no areas within this ES area which had been recommended for an intensive inventory. In New Mexico, the final decision on which areas will be intensively inventoried was made on July 9, 1979.

2. Intensive Inventory Results - The result of an intensive inventory would be a State Director's decision as to which remaining roadless areas are to be designated as Wilderness Study Areas. In New Mexico, this decision is scheduled for September 30, 1980.

3. Bureau Planning System Results - Once Wilderness Study Areas have been identified, the Bureau planning system would be used to weigh the wilderness potential of an area against any conflicting uses. If a decision is made that designation as a Wilderness Study Area is not recommended (due to prevailing conflicting uses), then the area in question would be recommended for removal from further wilderness consideration.

Decisions as to which Wilderness Study Area will or will not be recommended for designation as a wilderness would be made according to the Bureau planning system schedule. Congress has given the BLM until 1991 to complete these wilderness studies. Recommendations as to which Wilderness Study Areas (should any be identified) in the ES area should be designated as wilderness will be made by September 1987.

4. Congressional Action - Congress has reserved to itself the final decision concerning designation of an area as wilderness. Furthermore, the Congress has not limited itself to a time frame in which to make a decision.

Wilderness Consideration in the ES Area

The BLM tentatively identified 18 roadless areas of 5,000 or more contiguous public land acres within the ES area. These roadless areas contained a total of approximately 235,200 acres, encompassing all or part of 31 allotments. None of these areas were recommended by the State Director to undergo an intensive inventory. However, a 10,800 acre portion of the Mescalero Sands (Roadless Area 501) was selected for intensive inventory as a result of public review. This inventory has not yet been completed.

The ES area contains one "Instant Wilderness Study Area." This is the title given to the 55 formally designated primitive or natural areas which have been specifically identified by section 603 of FLPMA as the first areas to be studied during the BLM's wilderness review. According to this Act, the Secretary of Interior has until July 1, 1980, to make a recommendation to the President as to the suitability of such areas for designation as wilderness.

The ES Area's "Instant Wilderness Study Area" is the Mathers Natural Area. However, an intensive inventory of the wilderness potential for this Natural Area and its contiguous lands, has concluded the area does not contain wilderness characteristics. This preliminary decision underwent public review for 90 days begining March 12, 1979. This was concurrent with the public comment period for the initial inventory. The preliminary decision was confirmed by public review. A study report has been prepared which recommends that the Mathers Natural Area was unsuitable for wilderness designation.

LIVESTOCK GRAZING

There are 184 allotments operated by 151 ranchers within the East Roswell ES Area (BLM files). Their grazing preferences total 281,766 animal unit months (AUMs), which would be 23,480 animal units, based on authorizations established following the 1940-41 range survey (Appendix 2, Table B-9, Existing use of allotments).

The present active licensed use is 233,885 AUMs (19,490 animal units). Active licensed use was determined by computing an average of actual licensed use for the last three years (Appendix 2, Table B-9).

The ES area is open to all classes of livestock (Appendix 2, Table B-9). However, only cattle and horses are presently stocked, with the few horses being used in range-related activities on allotments. Primary breeds of cattle are Hereford, Angus, Brangus, Charolais, and Brahma. Most ranchers stock these breeds and crosses from them. Less than one percent of cattle herds are registered, 99 percent of this area's ranchers run nonregistered herds. Bulls are generally registered (approximately 80 percent).

The entire ES area is suitable for yearlong use. Cow/calf operations are most common even though a few operators run both cow/calf and yearling operations. There is a lot of variation in the management of individual ranches with 70 percent of the ranches running bulls with their herds yearlong, while some 30 percent only place bulls with their cows seasonally. These variations cause differences in weaning and shipping weights of calves. Number and season of sales are affected by these varied breeding practices.

Several ranchers have additional grazing lands which are separate from the public lands, others have grazing lands adjacent to the BLM-administered lands. Most ranchers use trucks to transport livestock to privately controlled lands but some trail their cattle to lands adjacent to the public allotments.

AGRICULTURE

Ten allottees (5020, 5024, 5075, 7001, 7002, 7005, 7018, 7035, 7036, and 7037) own farmland near the ES area which is suitable for grazing livestock. These operators commonly shift their herds to these croplands during drought or during periods of seasonal dormancy on the public lands. At these times, livestock graze primarily on alfalfa and, to a lesser extent, on both maize and cotton plants.

Agricultural croplands in east Chaves and Eddy Counties are restricted to those low-lying and fertile acreages adjacent to the east bank of the Pecos River. Lea County has considerable farmland east of the Caprock escarpment. Almost all is irrigated. Approximate acreages for these irrigated lands are: 4,700 in east Chaves; 3,300 in east Eddy; and 61,200 located in Lea County.

Principal crops in all three counties are cotton, sorghum, and alfalfa. Some peanuts and sunflowers are grown in Lea County and there are some small grains and corn grown occasionally in eastern Chaves and Eddy Counties.

Water available for irrigation is basically saline (averaging 1,000 to 4,000 parts of salt per million part of water), which causes some problems in the management of area soils. Generally, this is managed by growing alfalfa for three to five years, followed by a soil-depleting crop such as cotton for two years. Another technique is to grow crops which leave a high residue and improve the soil on a fourth of the acreage each year, returning the residue to the soil.

SOCIAL CONDITIONS

The proposed grazing management program would involve 184 allotments in three planning units east of the Pecos River and west of the New Mexico-Texas state line. Together, these units comprise parts of Chaves and Eddy Counties, and all of Lea County, and constitute the ES area as defined in Chapter 1. However, approximately half of the 152 ranch operators holding one or more of the affected allotments live just outside the ES area, chiefly in communities along the west bank of the Pecos River such as Artesia, Carlsbad, and Roswell. Therefore, for purposes of this analysis, a special study region has been defined and is referred to as "southeastern New Mexico." It includes all of Chaves, Eddy, and Lea Counties. Within this special study region, the focus of this analysis is on the relatively small group of families of ranch operators who would be directly affected by the proposed action.

Ranch Families and the Regional Population

In 1978, an estimated 600 persons were members of families of ranch operators holding allotments in the ES area (Harbridge House, 1979). These families comprised less than one-half of one percent of the total population of southeastern New Mexico. Table 2-5 shows the number of inhabitants reported for each county in the region since 1950. Despite population losses in the 1960's, the three counties have recorded an average annual growth rate of 1.1 percent over the past 29 years (U. S. Bureau of the Census, 1962, 1973; University of New Mexico, 1978). At the same time, however, the rural farm population of southeastern New Mexico has been declining, with a drop of 14 percent in the 8-year period between 1970 and 1978 (Harbridge House, 1979). This decline has occurred in most parts of the region, including the ES area.

TABLE 2-5
NUMBER OF INHABITANTS, SOUTHEASTERN NEW MEXICO, 1950-1978
(Source: See Below)

County	1950[a] Population	1950-60 Annual Growth Rate	1960[a] Population	1960-70 Annual Growth Rate	1970[a] Population	1970-77 Annual Growth Rate	1977[b] Population	1978[c] Population
Chaves	40,605	3.57	57,649	-2.90	43,335	1.86	49,300	50,200
Eddy	40,640	2.25	50,783	-2.13	41,119	1.46	45,500	46,200
Lea	30,717	5.69	53,429	-.76	49,554	.94	52,900	53,400
Southeastern New Mexico	111,962	3.75	161,861	-1.91	134,008	1.40	147,700	149,800

Sources: [a] U. S. Department of Commerce, Bureau of the Census, Census of Population: 1950-1970, Characteristics of the Population: New Mexico, 1952, 1962, and 1973.

[b] Provisional estimates provided by University of New Mexico, Bureau of Business and Economic Research, 1978.

[c] Provisional estimates on the basis of recent trends by Harbridge House, Inc., 1979.

Southeastern New Mexico has a population density of 10 persons per square mile, which compares to a state average of 9.8 persons per square mile. The ES area itself is much more sparsely populated, with fewer than 2 persons per square mile (U. S. Bureau of the Census, 1973; University of New Mexico, 1978). These densities are uniformly lower than the national average of 66 persons per square mile. Most residents of southeastern New Mexico live in one of the region's cities. Eight of every ten inhabitants reside in either Artesia, Carlsbad, Hobbs, Lovington, or Roswell; nearly half live in the cities of either Hobbs or Roswell (Employment Security Commission, 1978). Because of this concentration of population, unincorporated parts of Chaves, Eddy, and Lea Counties are largely uninhabited. Only the bottomlands of the Pecos Valley and the oil fields of Lea County have significant numbers of rural residents. The predominantly urban distribution of southeastern New Mexico's population is shown on Table 2-6. These urban residents include many of the area's ranchers. Population figures for individual communities are given in Table 2-7. Results of interviews with ranch operators with allotments in the ES area, indicate that half of them have other jobs or income sources and many have homes which are convenient for these other activities. Regardless of whether they live in urban or rural areas, or hold nonranch jobs, ranchers with allotments in the ES area share certain common characteristics. Only one is Spanish-surnamed, the remainder being of Anglo background. Most are males between 50 and 60 years of age, and heads of households with three to four dependents (Harbridge House, 1979).

TABLE 2-6
URBAN-RURAL POPULATION DISTRIBUTION: SOUTHEASTERN NEW MEXICO, 1978
(Source: See Below)

County	Urban Population	Percent of County Total	Rural Population	Percent of County Total	Total Population	Percent of County Total
Chaves	39,960	79.6	10,240	20.4	50,200	100
Eddy	35,950	77.8	10,250	22.2	46,200	100
Lea	39,460	73.9	13,940	26.1	53,400	100
Southeastern New Mexico	115,370	77.0	34,430	23.0	149,800	100

Source: Harbridge House, Inc., 1978, utilizing definitions of, and information from, the U. S. Department of Commerce, Bureau of the Census.

TABLE 2-7
NUMBER OF INHABITANTS OF MAJOR COMMUNITIES, SOUTHEASTERN NEW MEXICO, 1950-1977
(Sources: See Below)

Community	1950[a] Number of Inhabitants	Percent of County Total	1960[a] Number of Inhabitants	Percent of County Total	1970[b] Number of Inhabitants	Percent of County Total	1977[b] Number of Inhabitants	Percent of County Total
Chaves County								
Dexter	784	1.9	885	1.5	746	1.7	864	1.7
Hagerman	1,024	2.5	1,144	2.0	953	2.2	824	1.6
Lake Arthur	380	.9	387	.6	306	.7	283	.6
Roswell	25,738	63.3	39,593	68.6	33,908	78.2	39,270	79.6
Eddy County								
Artesia	8,224	20.2	12,000	23.6	10,315	25.0	10,658	23.4
Carlsbad	17,975	44.2	25,541	50.2	21,397	51.7	24,782	54.4
Hope	186	.4	108	.2	90	.2	138	.3
Loving	1,487	3.7	1,646	3.2	1,192	2.9	1,098	2.4
Lea County								
Eunice	2,352	7.7	3,531	6.6	2,641	5.3	2,680	5.0
Hobbs	13,875	45.1	26,275	49.1	26,025	52.5	29,163	55.1
Jal	2,047	6.7	3,051	5.7	2,602	5.2	2,746	5.2
Lovington	3,134	10.2	9,660	18.0	8,915	17.9	9,948	18.8
Tatum	688	2.2	1,168	2.1	982	2.0	722	1.3

Sources: [a] U. S. Department of Commerce, Bureau of the Census, Census of Population: 1950-1970, Characteristics of the Population: New Mexico, 1952, 1962, and 1973.

[b] Harbridge House estimates based on figures provided by Employment Security Commission of New Mexico, Annual Planning Report, Fiscal Year 1979, 1978.

Attitudes and Values of Ranching Families

Families of ranch operators having allotments in the ES area are characterized by a set of distinct attitudes and values. Ranching families have retained the outlook which is usually associated with rural, agrarian populations. They emphasize the importance of independence, self-reliance, and outdoor work, while distrusting government regulation, urban interdependence, and industrial occupations. Ranch work and related lifestyles are felt to be natural and moral, whereas occupations and activities in cities and towns are often perceived to be artificial and decadent. Ranch families cling to what they conceive as a "western way of life," one which they inherited from pioneer settlers. Despite low financial returns from ranching, they persist in ranch lifestyles. In doing so, ranchers express what has been labeled "ranch fundamentalism," the belief that ranching leads to a higher state of well-being than an alternative way of life (Smith and Martin, 1975).

Ranchers see the federal government, both in its philosophy of regulation and its practices of public land management, as being actively opposed to their independence and integrity. The attractiveness of ranching to these individuals is increasingly offset by the active role which government is taking in overseeing and regulating public land use. Consequently, ranch operators and members of their families frequently express hostile opinions of actions taken by the Bureau of Land Management and other agencies. Those criticisms usually apply as much to the idea that the federal government would take such action as to the particulars of a given situation. In southeastern New Mexico, such hostility is common in the ranch population and is the product of previous controversies involving BLM and ranch operators (Harbridge House, 1979).

In November and December of 1978, Harbridge House, Inc., conducted more than 100 interviews with inhabitants of Chaves, Eddy, and Lea Counties, including more than 40 ranch operators. Every one of the ranchers contacted discussed the activities of the Bureau of Land Management critically, as did a majority of other persons interviewed. When asked for their opinion, ranchers and members of their families usually expressed considerable anxiety and suspicion about future BLM actions. This alarm arose directly from the perception that BLM was acting against the best interests of ranchers and in such a way as to destroy traditional ranching. Table 2-8 shows key personal values reported by persons interviewed in southeastern New Mexico. The importance to ranchers of their independence and self-reliance is shown in the table. These values were frequently identified as being threatened by a government which increasingly seemed to emphasize regulation and control.

TABLE 2-8
VALUES OF RANCHERS AND OTHER RESIDENTS, SOUTHEASTERN NEW MEXICO, 1978
(Source: Harbridge House, Inc., 1979, Socioeconomic Study of Proposed Grazing Management Program East Roswell Grazing Environmental Statement Area, on file at Roswell District office, Bureau of Land Management)

Values	Percent of Population Segment Identifying Value		
	Rancher or Members of Ranch Family	Other Residents	Average
Independence, self-reliance	23	8	13
Rural Way of Life, Ranching Lifestyle	26	7	13
Community Friendship	8	17	14
Family	24	17	19
Church	15	10	12
Economic and Educational Opportunity	3	9	7

Note: Respondents identified more than one key value.

ECONOMIC CONDITIONS

Ranching has been a basic element of the economy of southeastern New Mexico for more than a century. In recent decades, ranching has been surpassed in regional importance by both mining and manufacturing. In rural parts of the region such as the ES area, however, ranching remains the chief economic activity and, in some localities, practically the only source of employment. Public lands are a key factor in this ranching activity. Ranchers with allotments in the ES area depend on public lands for an estimated 37.9 percent of livestock forage, as shown in Table 2-9. However, the extent of this dependence varies greatly between those ranch operators with allotments for which "specific grazing management systems" would be proposed, and those operators with allotments for which grazing management would be nonspecific. The latter depend on public lands for only 4 percent of livestock forage, while the former depend on public lands within their allotments for 61.4 percent. Because of this difference, and because of the lesser degree of grazing supervision being proposed for allotments with "no specific grazing systems," ranches which would only be involved in no specific grazing in the ES are excluded from further analysis here. No significant economic impacts on such ranches are projected in Chapter 3.

TABLE 2-9
RANCH DEPENDENCY ON PUBLIC LANDS, ES AREA, 1978
(Source: Harbridge House, Inc., 1979, Socioeconomic Study of Proposed Grazing Management Program, East Roswell Environmental Statement Area, on file at the Roswell District Office, Bureau of Land Management)

	Federal AUs		State and Private AUs		Total AUs	
Ranch Category	Number	Percent Of Total	Number	Percent of Total	Number	Percent of Tctal
WITH SPECIFIC SYSTEMS	18,589	61.4	11,680	38.6	30,269	100
Subsistence Size	693	72.7	260	27.3	953	100
Small Commercial Size	3,047	63.7	1,734	36.3	4,781	100
Medium Commercial Size	5,569	61.7	3,453	38.3	9,022	100
Large Commercial Size	9,280	59.8	6,233	40.2	15,513	100
WITH NONSPECIFIC SYSTEMS	848	4.0	20,352	96.0	21,200	100
Total	19,437	37.9	32,032	62.1	51,469	100

Ranches with public lands which would be placed under "specific grazing management" as a part of the proposed action, are heavily dependent on those public lands for range forage. As shown in Table 2-9, this dependency is greatest among subsistence-size ranches (1-74 cattle yearlong) with federal animal units (AUs) representing 72.7 percent of total AUs. Small commercial-size ranches (75-199 cattle yearlong) and medium commercial-size ranches (200-499 cattle yearlong) are dependent on public lands for 63.7 and 61.7 percent of their cattle, respectively. Large commercial-size ranches (500 or more cattle yearlong) are the least dependent, but nearly 60 percent of herds in this ranch size category graze on public lands. In order to obtain specific data regarding livestock ranches with allotments in the ES area, 42 field interviews were conducted by Harbridge House, Inc., with ranch operators. Questions asked in these interviews concerned fixed and variable costs of ranch operation and finance. Detailed information regarding these interviews is given in the report prepared by Harbridge House, Inc., and is available in the Roswell District Office of BLM.

Ranch budgets providing typical costs, receipts and returns for the four size categories given above are shown in Table 2-10. The budgets differentiate three key indicators of ranch financial condition: 1. net cash income, which is the difference between ranch sales and operating costs before making any allowance for depreciation of capital equipment and improvements; 2. net business income, which is the return to ranches after full allowance for depreciation has been made but prior to calculating any compensation for operator labor; 3. percent return on investment, which measures the interest earned on invested capital after allowance has been made for compensation of operator labor. Ranch sales include sales of livestock and other items such as salvage and resale of equipment and improvements. Operating costs include costs of feed, federal and state permits, fuel and equipment maintenance, labor, overhead and interest, taxes, veterinary and medical expenses, and purchase of bulls for breeding. Dollar figures used in calculated typical sales and costs by ranch size category are those reported in the area for 1978.

Ranch budgets outline net cash income, which shows the extent to which operators can cover their direct operating costs. When depreciation costs are counted, this income is greatly reduced. However, subsistence-size and small commercial-size ranches in southeastern New Mexico are often not commercial businesses but part-time ventures, and would be unlikely to make full allowance for depreciation of capital equipment and improvements. Net business income, as given in the ranch budgets in Table 2-10, is the return to ranchers remaining after full allowance for depreciation has been made. To the extent that ranch investment is fully depreciated and depreciation costs are, therefore nil, income (and profits) earned from ranching would be greater than those shown in the table. The ranch budgets also make an allowance for compensation of operator labor, assuming that the rancher himself would be paid a minimum hourly wage of $3.25 for the 50 hours a week (an estimated minimum) he works. For a 50-week year (also an estimated minimum), this hourly wage would equal $8,125. Returns to ranchers in excess of this amount are shown in Table 2-10 as interest on investment.

As Table 2-10 indicates, a typical subsistence-size ranch is not profitable as a business, although it earns sufficient cash income to cover operating costs. When full allowance is made for depreciation, net business income to subsistence-size ranches is negative, showing no return to operators for labor or interest. In fact, interviews with ranchers in southeastern New Mexico suggest that those operators with fewer than 75 cows yearlong make little provision for depreciating equipment and improvements, taking net cash income chiefly as compensation for their labor and as interest. Small commercial-size ranches typically have sales which are large enough to cover both operating costs and allowance for depreciation, but leave little return to the operator. Such small operations, like subsistence-size ranches, typically tend to ignore depreciation and use net cash income as compensation for labor and as interest. In business terms, therefore, typical subsistence-size and small commercial-size ranches are not profitable. In fact, a majority of ranches in these size categories with allotments in the ES area were operated by persons holding nonranch jobs or having other income sources. Few were run as full-time or nearly full-time concerns, and some appeared to be supported by nonranch income as so-called "hobby" ranches. By contrast, medium commercial-size and large commercial-size ranches with allotments in the ES area were profitable as businesses. Their sales were sufficiently large to cover operating expenses, make allowance for depreciation, provide compensation for operating expenses, make allowance for depreciation, provide compensation for operator labor, and return interest on the invested capital. However, net returns on investment, as shown in Table 2-11, for typical ranches in these two size categories, are low: 1.9 percent for ranches with between 200 and 499 cattle yearlong, and 2.3 percent for ranchers with 500 or more cattle yearlong. Cattle ranchers would have a better opportunity to make money elsewhere in the economy, where interest on invested capital often earns more than 4 percent annually and where manager-operators who make decisions similar to those required of ranchers, earn more than $8,125 a year. However, persistence in ranching by medium commercial-size and large commercial-size operators reflects a noneconomic commitment to ranching previously discussed as "ranch fundamentalism. In this sense, ranchers earn nonmonetary rewards in being able to pursue their chosen lifestyle, and these rewards are a partial compensation for their labor and investment.

Earnings from ranching do not represent the only source of income for ranch operators. In interviews with ranchers having allotments in the ES area in December, 1978, every operator in the subsistence-size category indicated he held a full-time or part-time job away from the ranch. For small commercial-size ranches, ranch operators were only 50 percent dependent on their ranches for personal income, while medium commercial-size and large commercial-size ranches were 75 and 80 percent dependent, respectively. For those ranchers who also owned or managed farms, returns from farming were greater than returns from ranching. A few ranch operators indicated that they received significant amounts of rents, royalties and interest income, but estimates of this income are not possible. Table 2-11 shows aggregate costs, receipts, and returns to ranchers from ranching only in the ES area. Neither Table 2-10 nor Table 2-11 show costs, receipts, and returns of other activities of ranch operators. Therefore, Table 2-11 does not show rancher income from farming associated with his livestock operations.

In the ES area, ranchers with public lands represent the principal economic activity in what is a sparsely-populated rural setting. But in southeastern New Mexico as a whole, these ranches are relatively less important. The estimated employment and income provided by ranches which would be placed under "specific grazing management" are shown in Table 2-12 in relation to total employment and income in Chaves, Eddy, and Lea Counties. Because of the large number of part-time and family workers or typical ranchers, the figure for ranch employment reflects an artificial total which does not reflect seasonal variations. While Table 2-12 suggests the limited economic significance of ranches which would be affected by the proposed action, the local importance of these livestock operations to their operators, families, and rural neighbors should not be overlooked.

TABLE 2-10
TYPICAL COSTS, RECEIPTS, AND RETURNS FOR LIVESTOCK RANCHES, ES AREA, 1978, WITH SPECIFIC GRAZING MANAGEMENT
(in 1978 constant dollars)
(Source: Harbridge House, Inc., 1979, Socioeconomic Study of Proposed Grazing Management Program, East Roswell Environmental Statement Area, on file at the Roswell District Office, Bureau of Land Management

Budget Items	Subsistence Size Ranch 36 AUs[d]	Small Commercial Size Ranch 136 AUs[d]	Medium Commercial Size Ranch 350 AUs[d]	Large Commercial Size Ranch 750 AUs[d]	Total All Ranches 26,402 AUs
Number of Ranch Units	20	37	29	14	100
Livestock Sales (Receipts)	$ 8,107	$ 30,578	$ 77,980	$ 166,770	$ 58,897
Operating Costs (Ranch)	5,696	14,193	30,330	67,868	24,688
Net Ranch Cash Income	$ 2,411	$ 16,385	$ 47,650	$ 98,902	$ 32,209
Depreciation Allowance	$ 4,059	$ 9,506	$ 20,417	$ 41,962	$ 16,123
Net Ranch Income	$ (1,648)[c]	$ 6,879	$ 27,238	$ 56,940	$ 16,086
RETURNS:					
To operator for labor[a]	$ 0	$ 6,879	$ 8,125	$ 8,125	$ 6,039
To operator for interest[b]	$ (9,773)[c]	$ (1,246)[c]	$ 19,113	$ 48,815	$ 9,961
CAPITAL INVESTMENT	$137,330	$407,780	$998,720	$2,143,650	$768,084
PERCENT RETURN ON INVESTMENT	(7.1)[c]	(0.3)[c]	1.9	2.3	1.3

[a] Return to operator for labor calculated with base rate of $8,125 or $3.25 an hour, minimum wage, for 50 hours a week, 50 weeks a year.
[b] Return to operator for interest calculated on returns remaining after labor compensation.
[c] Parentheses ( ) indicate a negative value.
[d] Average size ranch.

TABLE 2-11

AGGREGATE COSTS, RECEIPTS, AND RETURNS FOR LIVESTOCK RANCHES, ES AREA, 1978, WITH SPECIFIC GRAZING MANAGEMENT
(in 1978 constant dollars)
(Source: Harbridge House, Inc., 1979, Socioeconomic Study of Proposed Grazing Management Program, East Roswell Environmental Statement Area, on file at the Roswell District Office, Bureau of Land Management

Budget Items	Subsistence Size Ranches 36 AUs[d]	Small Commercial Size Ranches 136 AUs[d]	Medium Commercial Size Ranches 350 AUs[d]	Large Commercial Size Ranches 750 AUs[d]	Total All Ranches 26,402 AUs
Number of Ranch Units	20	37	29	14	100
Livestock Sales (Receipts)	$ 162,140	$ 1,131,386	$ 2,261,420	$ 2,334,780	$ 5,889,726
Operating Costs (Ranch)	113,920	525,141	879,570	950,152	2,468,783
Net Ranch Cash Income	$ 48,220	$ 606,245	$ 1,381,850	$ 1,384,628	$ 3,420,943
Depreciation Allowance	$ 81,180	$ 351,722	$ 591,948	$ 587,468	$ 1,612,318
Net Ranch Income	$ (32,960)[c]	$ 254,523	$ 789,902	$ 797,160	$ 1,808,625
RETURNS:					
To operator for labor[a]	$ 0	$ 254,523	$ 235,625	$ 113,750	$ 603,898
To operator for interest[b]	$ (195,460)[c]	$ (46,102)[c]	$ 554,277	$ 683,410	$ 996,125
INVESTMENTS	$2,746,600	$15,087,860	$28,962,880	$30,011,100	$76,808,440
PERCENT RETURN ON INVESTMENT	(7.1)[c]	(0.3)[c]	1.9	2.3	1.3

[a] Return to operator for labor, calculated with base rate of $8,125 or $3.25 an hour, for 50 hours a week, 50 weeks a year.

[b] Return to operator for interest calculated on returns remaining after labor compensation.

[c] Parentheses ( ) indicate a negative value.

[d] Average size ranch.

TABLE 2-12

INCOME[a] AND EMPLOYMENT: SOUTHEASTERN NEW MEXICO, 1977
(Source: Harbridge House, Inc., 1979, Socioeconomic Study of Proposed Grazing Management Program, East Roswell Environmental Statement Area, on file at the Roswell District Office, Bureau of Land Management)

Sector	Income		Employment	
	Personal	Percentage of Area Total	Number of Workers	Percentage of Area Total
	-----$1,000------			
Agriculture[b]	$ 55,400	8.1	3,890	7.1
(Ranch livestock in ES area)	5,890	0.9	200	0.4
Mining	162,715	23.7	9,785	17.9
Construction	43,905	6.4	3,255	6.0
Manufacturing[c]	55,895	8.2	4,270	7.8
Transportation, communication, and utilities	69,290	10.1	4,200	7.7
Trade	112,790	16.5	12,095	22.1
Finance, insurance, and real estate	22,065	3.2	2,060	3.8
Services	77,770	11.3	7,245	13.2
Government	85,660	12.5	7,905	14.4
	$685,490	100.0	54,705	100.0

[a] Data concerning income and employment in southeastern New Mexico, 1977.

[b] Data gathered by Harbridge House in August, 1978.

[c] Data from the New Mexico Department of Human Services, Employment Service Division, Table B, Labor Information Series, 1978.

CHAPTER 3

ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

Chapter 3

THE ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

This chapter identifies and analyzes impacts of the proposed action on the human environment. Each impact is analyzed in a "cause and effect" manner with secondary impacts being identified and traced as far as is practical.

In each case, the "cause" is tied to a component of the project proposal introduced in Chapter 1, while the "effect" identified is tied to a component of the environment as discussed in Chapter 2.

Components identified in Chapter 2 as not being significantly impacted will not be discussed further.

Several basic assumptions have been made and analysis guidelines established by BLM specialists in assessing the proposed action's impacts on various environmental elements. These assumptions also apply to the impact assessment portions of Chapter 8, Alternatives to the Proposed Action. Specific assumptions are included in the respective sections.

1. Short-run impacts are those which would occur during the eight-year implementation period. Long-run impacts are those which would still be present at the end of the 20-year period when most objectives of the proposed action have been met. Short-term impacts include those concerning the short-run and those involved in the long-run. Long-term impacts are restricted to those which would persist beyond the 20-year period when the short-term objectives would have been met.
2. Current uses of private lands in the East Roswell ES Area would remain essentially the same, after implementation of the proposed action. These lands are being used primarily for livestock grazing or for activities associated with grazing operations.
3. The demand for meat production would increase in future years.
4. The Bureau of Land Management (BLM) would fund the improvements required to implement the action and would do so within the stated time.
5. The necessary manpower would be furnished by and to the East Roswell ES Area and a rigorous effort would be made to carry out all the required studies and monitoring. Additionally, all design restrictions described in Chapter 1 would be effectively carried out.
6. In addition to the improvements described in the proposed action, the existing improvements would be maintained in a serviceable condition.
7. Scientific knowledge is not presently available to assess long-term impacts to the fullest extent.
8. Any change in production, trend, and condition of vegetation would affect all other resources.
9. Wildlife would continue to graze pastures which are being rested from livestock grazing.
10. Local impacts are those which are restricted to the immediate vicinity of the action being discussed, although the actual distance may

vary according to the resource being discussed. Unless otherwise stated, all other impacts are assumed to affect the entire ES area.

11. Because information concerning actual livestock use has not been collected, an exact amount is not known. Estimates by BLM specialists are that actual use is approximately equal to licensed use although a few operations probably vary from this amount to a small extent each year.

12. Based on historical records, BLM vegetation specialists assume that most of the ES area's existing brush is a result of its invasion onto range which had previously been dominated by grass.

13. Vegetative conditons would remain unchanged on areas where "no specific grazing" systems would be required. Operators would continue their present management systems.

14. Without brush control programs, grasses which are present in areas of moderate to heavy infestations of brush (e. g.: mesquite, creosote, and shinnery oak) would not show a significant improvement in their density under either grazing treatments proposed or the total removal of livestock.

15. Onsite analysis of areas proposed for inclusion in projected brush control treatments would be made to avoid highly desirable wildlife habitat and cultural resources which would be susceptible to the treatments being considered.

16. In the long-run, uncontrolled state and private lands would be controlled by the livestock operator.

17. Picloram and dicamba tank mixes will be labeled for rangeland use by the Spring of 1980.

18. Except for social and economic conditions, assessments for all resources were based upon forage AUMs produced on the public lands of all allotments. To assure a balanced socioeconomic assessment of the ES area, the production of AUMs estimated for all lands was included in order to determine direct income and to thoroughly analyze impacts on ranchers.

19. The economic assessment was based on the assumption that livestock market conditions would remain constant.

20. The economic assessment assumes that capital values of grazing permits would not change with the proposal.

21. The ranch budgets constructed for this assessment constitute an economic model which describes the behavior of so-called "typical ranches" in the ES areas and these "typical ranches" do not correspond specifically to budgets of any few particular ranches.

22. The ranch budgets used for this assessment constitute an economic model of ranches as enterprises which seek to maximize, or make profits in economic terms, and cannot completely describe the behavior of ranchers insofar as their behavior is influenced by noneconomic factors, such as attitudes and values associated with so-called "ranch fundamentalism." In this regard a standard allowance was made for depreciation of ranch equipment and improvement, although many ranch operators do not make full provision for such costs. This allowance was

made to insure that the capital costs which would face a new or recent ranch purchaser would be fully considered, although most ranch operators in the ES area are long established and might not carry costs of the same magnitude. To the extent that families operating ranches in the ES area have fully depreciated most of their capital investment, ranch budgets as discussed in this ES overstate their costs and underestimate their profit. Therefore, the allowance for capital depreciation might be somewhat artificial and tend to misrepresent the financial flexibility of ranch operators. However, to be consistent with practices of the Economic Research Service (ERS) of the U.S. Department of Agriculture (USDA), fixed costs were included as a necessary component of ranch budgets.

23. The ranch budgets used for this assessment are based on the total herd sizes of affected ranch operators, rather than simply on the number of animal units directly dependent on public lands. In order to describe accurately the full impacts of the proposed action and its alternatives on ranches in the ES area, the analysis was based on total, combined adjustments in levels of grazing on federal, state, and private lands, both those required by BLM and those indirectly resulting from those federal requirements. Therefore, projected impacts on ranch sales and net income are larger than they would be if they were simply based on changes in federal AUs, and differ in this way from all other impacts described in the ES.

VEGETATION

Chemical Brush Control

The use of picloram and dicamba for the control of invading mesquite and creosote brush would impact the ES area's vegetative resources. The majority of the initial treatment would be an aerial spray of 51,800 acres of mesquite using 1/4 lb. (active ingredient) dicamba plus 1/4 lb. (active ingredient) picloram per acre. As proposed, a total of 1.5 pints of chemical would be mixed with 2 pints of emulsifiable diesel fuel and 12.5 pints of water for a total sprayed solution of 2 gallons per acre. This spray formulation has been recommended, after extensive tests, for mesquite control in this semiarid climate by Dr. Pete Jacoby, Texas A & M University, (Jacoby personal communication: 1979).

Dicamba in a granular (5 percent active ingredient per granule) form is proposed for use on 2,120 acres of low density mesquite with an expected average mesquite kill of 40 percent.

Picloram in a granular form (10 percent active ingredient per granule) is proposed for use on 360 acres of creosote with an expected average creosote kill of 50 percent.

A summary of the proposed initial treatment (54,280 acres) on range sites within allotments is in Chapter 1, Table 1-6. Proposed treatments and the percentage of control expected for the total 961,364 acres are summarized in Chapter 1, Table 1-7.

Overall, chemical treatments should control 40 percent of all mesquite and creosote within a treated infestation. Killing just 30 percent of treated plants would be adequate to boost forage plant production and remove the dominance of invading brush.

Foliar sprays of dicamba and picloram are absorbed into the plant through small holes in the leaf surface called stomata or directly through the leaf cuticle. At proper application rates, the chemicals are readily transported by the plant's vascular system to points of active growth, such as root tips and new foliage. Herbicide movement within the plant is favored by good soil moisture and growing conditions. Susceptible plants are killed as the herbicide is transported within the plant causing damage to parenchyma, phloem, and cambium structures.

Granular formulations, applied on the soil surface, are leached into a plant's rooting zone following rain. Killing of the plant occurs when the chemicals, together with nutrients and water assimilated through the soil, are drawn into the plant by the root system.

Dissipation of dicamba from vegetation occurs several ways: 1. metabolism within the plant, 2. exudation from the root system or, 3. loss from leaf surfaces by being washed off, photodecomposition, and chemical decomposition (Malina 1967). In general, dicamba rapidly dissipates from vegetal material as reflected in its rapid departure from bluegrass and bermudagrass. One-half pound of dicamba per acre had reduced from 14.2 parts per million (ppm), seven days after treatment, to 0.62 ppm 60 days after treatment (Malina 1967). Dissipation from an initial treatment of 1/4 pound of dicamba per acre was not measured but is logically assumed to be only a trace amount by 60 to 90 days after treatment.

Residues of dicamba, either sprays or granular, would not persist through a single year because of its susceptibility to photo and microbial decomposition (Scifres and Allen 1973), thus none would reappear in vegetal material the following year.

Picloram is somewhat more persistent in vegetation than dicamba, probably because of its longer residual period in soils. Scifres, et al. (1971), followed the disappearance of 1/4 pound of picloram per acre sprayed on grasses of northwest Texas. The chemical disappeared at 2.5 to 3 percent per day for 30 days. In a similar study, Scifres, et al. (1971), had detected a residue of less than 10 percent of a 1/4 pound per acre picloram treatment in grasses 30 days after application. Similar steady dissipation rates were reported by Getzender, et al. (1969). They found 200 ppm immediately after treatment utilizing one pound per acre of picloram on grasses. The chemical declined most rapidly during the first two weeks after treatment, remained fairly constant from the 8th to 16th week, then declined further. Getzender, et al. (1969), detected 1.0 to 6.0 percent of the initial deposit one year after treatment. No form of picloram was found to be bound up in grasses.

Granular applications of picloram do not initially produce high residues in plants. Residues in vegetation accumulate slowly by root uptake to a peak within 8 to 16 weeks. Trace amounts have been detected up to two years after treatment (Getzender, et al., 1969).

Persistence of the herbicides within the plant rooting zone would most likely occur when: 1. soil textures reduce the degree of percolation and downward movement of the chemical, 2. land surface is densely vegetated, 3. soil surface has less than a 2 to 3 percent slope, 4. high rates of herbicides are applied, and 5. low-intensity rains are received.

Chemical brush control is proposed on soils varying from a loose sand (sandy range site) to clay loam (bottomland range site) (See Table 1-6 of Chapter 1). On sandy areas (90 percent of the initial treatment area), chemicals would rapidly leach into the soil following a rain. Most moisture infiltrates directly into sandy soils, removing chemicals from contact with the foliage structure of most plants. Areas with more compact soils would not permit rapid percolation into the subsurface.

It is unlikely that residues of picloram or dicamba would be translocated away from the target areas. Formulations proposed are not volatile, therefore, drift from sprays should travel less than 300 feet. Onsite chemical decomposition would begin upon contact with plants and soil and from the high amounts of ultraviolet light which are typical of the long, cloud-free summer days in southeastern New Mexico. Chemicals remaining on foliage would be washed into the mostly sandy soils during summer thunderstorms. Chemical degradation would be completed within the soil profile. Herbicides are not proposed for use on shallow soils with steep slopes thus decreasing any chance of transporting chemicals downslope. Proposed treatment areas are within a closed drainage basin which is without live streams capable of transporting these chemicals off the site. Bureau policy would prevent chemical treatments from taking place near the Pecos River, playas, dirt tanks, or available livestock drinking water. (See standard operating procedures Chapter 1.)

A listing of brush species known to be susceptible to those chemicals proposed for use is provided in Appendix 3, Table C-1. The spray mixture utilizing both picloram and dicamba is considered to be capable of controlling broom snakeweed, catclaw acacia, creosote, and mesquite, if these species are sprayed while actively growing and with full canopies (Jacoby, personal communication: 1979). Spray treatments in the ES area are proposed only when mesquite is highly susceptible from mid-May to July 1. At this time, a 40 percent kill of existing mesquite plants is expected (Jacoby, personal communication: 1979). The herbicide mixture proposed for use should cause a partial defoliation of creosote, catclaw acacia, broom snakeweed, shinnery oak, and littleleaf sumac.

Hand applications of dicamba granules (5 percent active ingredient) would be selective for each target mesquite plant. In the event that early summer rains are received, creosote, tarbush, and forbs may initiate growth while dicamba granules are still present. These plants would then be defoliated and possibly killed if they are adjacent to a treated mesquite. Other shrubs and grasses would not be harmed (Bovey 1977).

Picloram granules, (10 percent active ingredient at a rate of 1 lb./acre) would kill at least 50 percent of creosote present. The chemical would likely defoliate and possibly kill other plants occasionally in the treatment area: forbs, prickly pear, tarbush, and littleleaf sumac.

Picloram and dicamba are both toxic to actively growing forbs. Past treatments with foliar applications of phenoxy herbicides have had effects comparable to those expected under the present proposal. Although most forbs present during spring treatments utilizing phenoxy herbicides were killed, seedling forbs emerged and established soon after rain was received. By August, after a June treatment, numerous palatable forbs, such as spectaclepod, flourished in the spaces between mesquite. Also increasing were sunflowers, lemonweed, bladderpod, and pigweed. Plains bristlegrass, a highly desirable forage and watershed plant, made tremendous increases by the second year after treatment. By the third year, forb production declined slightly as grasses increased, i.e.: mesa dropseed, black grama, and bristlegrass (Leifeste, personal communication: 1978).

Two pints/acre of diesel fuel within the spray mixture are not considered sufficient to damage live vegetal material or to persist in detectable amounts longer than one year (Jacoby 1979 and Girard 1978 personal communications).

Specific Grazing Management

Under the proposed action, 110 of the ES area's 184 allotments would be operated under grazing management systems designed specifically for each allotment. Allotment-specific management would include: 1. a maximum of 40 to 60 percent utilization of key forage plants annually, 2. grazing treatments designed to rest each pasture sufficiently to maintain forage plant vigor and reproduction, and 3. brush control projects designed to favor herbage production. Improved range condition and trend would result from the combined effects of this proposal, specifically: 1. Composition: a decrease in the percentage of mesquite and creosote on allotments, resulting in increased percentages of grasses and forbs, 2. Production: increases in the production of herbage plants, and 3. Cover: increases in vegetal material serving as ground cover.

Table 3-1 summarizes responses expected of the major vegetative communities both when infested with brush or when free of infestation. The various grazing treatments would be expected to influence the recovery or deterioration of these communities.

Range condition as described in Chapter 2 was defined in terms of suitability for livestock grazing. Responses of vegetative types are projected in Table 3-1 as though the vegetative community were in either poor, fair, or good condition at the time the proposed action would be initiated. In general, Table 3-1 shows that the most rapid improvements occur when invading shrubs are controlled and 16-month, 20-month, or

2-year rest treatments are provided. Sustained improvements would not occur on brush-infested areas under any type of grazing treatment because the competition for soil moisture by brush species would still be present. The change in vegetative condition shown on Table 3-1 is indicative of what would be expected to happen to composition, forage production, and cover. The dynamics of vegetative change are presented within the following sections: composition, production, and cover.

Composition

Control of mesquite and creosote on 961,364 acres would initiate dramatic changes in plant composition within the first growing season following treatment. In general, the invading shrub species would be replaced by the previously dominant grass and forb species. During the mid-1960's the Roswell District used herbicides to kill invading mesquite. These treatments resulted in significant increases of desirable grasses and forbs (Leifeste 1971). The first year after a treatment which killed 30 to 50 percent of mesquite, palatable forbs such as spectaclepod and bladderpod began emerging in the open spaces between dead mesquite plants soon after arrival of the midsummer rains. First year grass recovery was primarily from sand dropseed which emerged from its abundant seed source in the former mesquite canopy zones. Percentage composition of dropseed continued to increase during the second and following years. Highly desirable, perennial forage grasses such as black grama and plains bristlegrass made threefold increases 3 to 5 years after the dominating brush stand was controlled. The proposed treatments would be conducted on similar mesquite-invaded plant communities as those described by Leifeste. Therefore, a vegetative response is expected that would be similar to those of past BLM spraying programs. Following treatment, a sustained recovery of the grassland communities in the ES area would be aided by the immediate 16-month deferment of livestock grazing that is mandatory. In addition, grazing rest provided by the implementation of allotment-specific grazing management systems would continue to allow forage plants to recover.

Changes in composition can be attributed to increases in soil moisture which becomes available after mesquite has been killed. In sandy soils, heavily infested mesquite areas are characterized by small hummocky dunes around the mesquite plants and with sparsely vegetated soils between dunes. When the mesquite dies and loses its ability to bind sand, areas between the dunes (interdune) receive some of the loose and more fertile soils previously held in the canopy zone. Production of herbage plants in these interdune areas would be enhanced by the additional topsoil (Leifeste 1971) and by the increase in soil moisture which would become available after the lateral roots of mesquite plants die (Cable and Martin 1975; Brock 1978).

During the mid-1960's, mesquite control programs utilizing chemicals resulted in dramatic increases of those desirable grasses and forbs which previously grew only beneath shrub canopies (Leifeste 1971).

TABLE 3-1
PROBABLE RESPONSE OF MAJOR GRASSLAND COMMUNITIES TO THE PROPOSED ACTION AND ALTERNATIVES BASED ON POSSIBLE CONDITION CLASSES
(Source: BLM Employee Observations*)

Dominant Grassland Species	Potentially Dominant Species (Acres)	Type of Brush Infestation	Possible Range Condition[a]	Moderate Utilization (40 to 60 percent) on annual growth of key species												Other Alternatives	
				No Rest[b]		Rest 4 months[d]		Rest 8 months[e]		Rest 16 months[f]		Rest 20 months[g]		Rest 2 years[h]		No Action[i]	No Grazing[j]
				No Treat.	Treat.[c]	No Treat.	Treat.	No Treat.	Treat.	No Treat.	Treat.	No Treat.	Treat.	No Treat.	Treat.		
Black Grama/ Bush Muhly	115,000		P	►		►		►		▲		▲		▲		►▼	▲
		None	F	►▼		►		►		▲		▲		▲		►▼	►▲
			G	►▼		►▼		►▼		►		►		►		►▼	►
		Mesquite	P	►▼	▲►	►	▲	►	▲	►	▲	►	▲	▲►	▲	►▼	▲►▼
		and/or	F	►▼	▲►▼	►▼	▲►	►▼	►▲	►▼	▲	►	▲	▲►	▲	►▼	▲►▼
		Creosote	G	▼	▲►▼	►▼	▲►	►	►▲	►▼	►▲	►▼	►▲	►▼	►▲	▼	▲►▼
Dropseed/ Bluestems	870,000		P	►		►		►		►▲		▲		▲		►▼	▲
		None	F	►▼		►		►		►▲		▲		▲		►▼	▲►
			G	►▼		►		►		►▲		►▲		►▲		►▼	▲►
		Shinnery oak	P	►▼	▲►▼	►▼	▲	►▼	▲	►	▲	►	▲	►	▲	►▼	▲►
		and/or	F	▼	▲►▼	►▼	▲	►▼	▲	►	▲	►	▲	►▼	▲	▼	▲►▼
		Mesquite	G	▼	▲►▼	►▼	►▲	►▼	►▲	►▼	►▲	►▼	►▲	►▼	►▲	▼	▲►▼
Dropseed/ Black Grama Bluestem	346,000		P	►		►▲		►▲		►▲		▲		▲		►▼	▲
		None	F	►▼		►▲		►▲		►▲		▲		▲		►▼	▲►
			G	►▼		►▲		►▲		►▲		►▲		►▲		►▼	▲►
		Shinnery oak	P	►▼	▲►▼	►▼	▲	►▼	▲	►	▲	►	▲	►	▲	►▼	▲►
		and/or	F	▼	▲►▼	►▼	▲	►▼	▲	►	▲	►	▲	►▼	▲	▼	▲►▼
		Mesquite	G	▼	▲►▼	►▼	►▲	►▼	►▲	►▼	►▲	►▼	►▲	►▼	►▲	▼	▲►▼
Sacaton/ Tobosa	41,000		P	►		▲		▲		▲		▲		▲		►	▲
		None	F	►		▲		▲		▲		▲		▲		►	▲►
			G	►		►		►		►		►		►		►	▲►
		Mesquite	P	►▼	▲►	▲►	▲	▲►	▲	▲►	▲	▲►	▲	▲►	▲	►▼	▲
		and/or	F	►▼	▲►	▲►	▲	▲►	▲	▲►	▲	▲►	▲	▲►	▲	►▼	▲►
		Saltcedar	G	►▼	▲►	▲►	▲	▲►	▲	▲►	▲	▲►	▲	▲►	▲	►▼	▲►
Gyp Grama	80,000		P	►		►		►		►		►		►		►	▲
		None	F	►▼		►▲		►▲		►▲		►▲		►▲		►▼	▲►
			G	►▼		►▲		►▲		►▲		►▲		►▲		►▼	▲►
		Mesquite	P	►▼	▲►	▲►	▲	▲►	▲	▲►	▲	▲►	▲	▲►	▲	►▼	▲►
		and/or	F	►▼	▲►	▲►	▲	▲►	▲	▲►	▲	▲►	▲	▲►	▲	►▼	▲►
		Creosote	G	►▼	▲►	▲►	►▲	▲►	►▲	▲►	►▲	▲►	►▲	►	►▲	►▼	▲►

Response Legend
Vegetative Change within Twenty Years

▼	Decline in range condition.
►▼	Gradual decline in range condition.
▲►▼	Initial improvements in plant vigor. Gradual, long-term declines in range condition.
►	Static condition. No significant changes.
►▲	Gradual improvement in range condition.
▲	Improvement in range condition.

[a] Column 4 presents possible condition class that any portion of the range may be in: Poor, Fair, Good.
[b] No rest would be guaranteed on non-AMP allotments.
[c] Treatments are fully discussed in Chapter 3 text: Chemical and Mechanical.
[d] Rest 4 months (July 1 to Oct. 31), 1 year in 4.
[e] Rest 8 months (March 1 to Oct. 31), 1 year in 4.
[f] Rest 16 months (July 1 to Oct. 31), 1 year in 4.
[g] Rest 20 months (March 1 to Oct. 31), 1 year in 4.
[h] Rest 2 years in 4.
[i] Assumes that existing livestock management practices would continue.
[j] No grazing alternative and exclusion areas.
*Note: Methodology for this table is contained in the Vegetative portion of Chapter 3.

Following treatment, palatable forbs such as spectaclepod and bladderpod began emerging in open spaces between mesquite soon after it rained. Threefold increases in plains bristlegrass, dropseeds, and black grama were recorded following mesquite control. Similar changes in plant composition were monitored by Brock (1978) in northwest Texas. Following programs to control mesquite, the spaces between dead brush plants became vegetated by desirable grasses such as Texas wintergrass and Arizona cottontop (Brock 1978). Continued recovery of forage plants in the ES area would be assured by the 16-month deferments of livestock grazing which are mandatory following treatment and with implementation of grazing systems.

Composition would also be altered by the mechanical grubbing of mesquite which would kill 80 to 95 percent of this brush on 440 acres of the sandy range site. A small amount of regrowth would be expected from plants that are too small to be seen by the tractor operator. There is also the disadvantage that mechanical grubbing kills most of the grasses and forbs growing beneath treated plants.

The chemical control of creosote on 360 acres initially with 105,880 acres being controlled in the total program would result in a vegetative response that favors desirable grasses such as bush muhly and black grama, which had dominated those areas before the invasion of creosote.

The livestock stocking rate adjustments as described in Chapter 1 and shown on Table A-3 would prevent overuse of the vegetative resource. Proper use along with the grazing treatments, also described in Chapter 1 and analyzed in Table 3-1, would provide periods of rest from grazing to allow desirable grasses and forbs to maintain high vigor and reproduce. Each grazing treatment would be developed in consultation with the allottee and would fit the vegetation requirement in each pasture.

Brush-free, grassland areas in fair and poor condition would have composition changes toward grass sites. The black grama/bush muhly grassland would benefit from the proposed grazing treatments because a minimum of 16-month's rest every four years would be required. According to Paulsen and Ares (1962), black grama requires the production and establishment of stolons which would be provided by a 16-month's rest period. A minimum of 115,000 acres of black grama/bush muhly would be subjected to this type of grazing treatment. Bush muhly should also maintain high vigor and increase on those black grama ranges which have been rested for at least two growing seasons out of four.

Most of the black grama/bush muhly grassland that is currently infested with mesquite and creosote would receive brush control treatments. A small portion (approximately 5,000 acres) would not have brush controlled. Such untreated areas would not recover, even with grazing systems implemented. Grass and forb communities would degenerate rapidly if light infestations of these brush species were allowed to increase. Valentine and Girard (1968) recorded the conversion of brush-free range in good condition to a creosote subtype in 12 to 15 years. Mature creosote adjacent to the area was found to have produced a heavy crop of viable seed which then infested the range.

Dropseeds and bluestems are more tolerant of grazing than black grama. Miller and Donart (1979) found that mesa dropseed could tolerate defoliation while in a vegetative stage. Their clipping study suggests that annual grazing during the flowering and seed producing periods (late summer and fall) would decrease plant vigor and prevent increases of the dropseeds. Grazing responses of little bluestem and sand bluestem should be similar to mesa dropseed; bluestems thrive when grazed moderately and given occasional rest during the growing season (BLM observation). Therefore, BLM range conservationists assume that grazing treatments which provide rest during the growing season, twice or more in a four-year period, should assure improvement of bluestem and dropseed grasslands.

Roughly 500,000 acres of the dropseed/bluestem grasslands are infested with mesquite and/or shinnery oak. This acreage is not proposed for brush control programs and is not expected to improve in condition. Observations on BLM allotments (No. 5043 and No. 7007) have documented that moderate to light grazing pressure is insufficient to accomplish grass recovery until brush is controlled (BLM observation and personal communication with Leifeste 1978).

The composition and density of either tobosa or sacaton is not expected to decrease under any of the proposed grazing treatments. In the ES area, tobosa and sacaton are particularly tolerant of yearlong grazing at moderate to heavy stocking pressures. Similarly, in southcentral New Mexico, tobosa was found to be tolerant of moderate grazing pressure with little or no deferment (Canfield 1939; Paulsen and Ares 1962).

Gyp grama grasslands do not support good stands of palatable forage plants. Because livestock do not congregate on these areas, occasional rest during growing season should maintain the composition of this vegetative community.

The vegetative composition, production, and cover of accessible riparian areas, broadleaf tree groves, fresh water playas, and dirt tanks are heavily impacted by livestock. These regions are especially attractive to livestock because shade and/or succulent forage are available. Trampling by livestock retards the establishment of grasses, forbs, and tree seedlings. Tree groves which are accessible to stock, are undergrown by rank, unpalatable forbs (e.g., cocklebur and pigweed). Recovery of forage plants, establishment of tree seedlings, and the growth of aquatic plants in such deteriorated areas would depend upon resting these areas for at least two growing seasons out of four (BLM observation). Thus, the proposed rest period of 16 months would be a minimum necessary for recovery of vegetation on these preferred livestock sites. Severson and Boldt (1978) suggest that hardwood tree grove areas would be less impacted by grazing during the dormant season or by alternating between summer and winter use. Such management would successfully mitigate some adverse impacts because livestock are less attracted to shady or damp areas in winter.

The proposed burning on 520 acres of tobosa and sacaton grasslands would impact the composition of species which would remain. Most of these burn areas are low-lying swales which have some mesquite, saltcedar, and fourwing saltbush growing within them. Burning would control approximately 50 percent of mesquite with trunks less than 0.5 inches in diameter (Glendening and Paulsen 1955). Mature mesquite would be defoliated and suppressed, but probably less than 10 percent would be killed (Reynolds and Bohning 1956). Burning would proliferate resprouting in fourwing saltbush and sumac (Humphrey 1949) and saltcedar (BLM observation) with little or no plant mortality. The burning of old-growth tobosa and sacaton would favor the growth of forbs and the development of a more diverse composition of grasses. Areas in southeastern Arizona where sacaton had been burned (Bock and Bock 1978) significantly increased their diversity of forbs and grasses as compared to adjacent areas which had not been burned. Changes in the diversity of grasses within the burned area would be attributable to removal of the dense sacaton or tobosa overstory, thus opening the site to growth of forb seedlings and grasses. After burning had been completed, the new growth of sacaton and tobosa would be preferred by livestock for up to two years after treatment (Dahl, et al., 1977). Livestock grazing with schedules which permit rest during the growing season at least once in four years, together with periodic reburning, would maintain forage diversity and palatability.

Range conditions would improve as a result of the proposed brush control and grazing rest treatments. The restoration of the grassland community would result in improved species composition, increased production, and additional vegetative ground cover. By the year 2000, the proposed action is expected to result in 1,306,000 acres being in good condition, compared to only 352,000 acres in good condition presently. The existing 1,169,000 acres in fair condition would be reduced to 255,000 acres. Poor condition acreage would drop from the existing 69,000 acres to only 29,000 acres (Data in Table 2-1). Areas without control of invading brush would not improve from poor condition.

Production

Forage production increases would occur after the invading shrubs are reduced by herbicide treatments. The resulting change in composition would favor grass and forb production as it returns toward climax conditions. By removing invading shrubs, the competition between these brush plants and the desirable forage plants for soil moisture would be reduced or removed. Previous brush control programs in the Roswell BLM District resulted in an increased production of forage to a degree comparable to amounts produced on sites which are considered by SCS to be in excellent condition. The 1965 mesquite control program on a sandy range site (allotment No. 6037) is representative of increases that would be expected within 2 to 3 years after the proposed brush control treatments have been implemented. This is because much of the area to be treated is similar in nature to the sandy range site. On the treated area, perennial grass production recovered from about 84 pounds per acre to 463 pounds per acre which approximates the site's potential 2 years after mesquite control, compared to a consistent 84 pounds per acre on adjacent untreated areas (Leifeste 1971). This increase in production followed a 50 percent kill of a heavy invasion of mesquite. It is, therefore, assumed that each range site in the treated acreage would recover to production levels roughly equivalent to its potential when in excellent condition.

Table 3-2 summarizes the existing and potential forage production, in AUMs, for the proposed initial treatment. This represents only forage which would be properly usable for grazing and would be less than half of the total vegetative production. In general, total production would almost triple, once brush is controlled on these productive range sites. The area to be initially treated is expected to increase from the existing 6,273 AUMs to 16,975 AUMs within 3 to 5 years. The deep sand, sandy, and sand hills range sites would be the target for the majority as well as for the total program. This is because of their high potential for an increase in production and their high potential productivity. Potential increases in production for all allotments, following the total program to control brush (961,364 acres), are presented in Appendix 1, Table A-8).

Following programs to control brush, increases in soil moisture would permit increases in the production of grasses and forbs. On 54,280 acres scheduled for the initial brush control program, production of AUMs would increase by 10,702 from an existing 6,273 to 16,975 AUMs within three to four years after treatment (methodology for projecting future AUM production is described in Appendix 1). The active duneland land type is not considered to have a potential for forage production, according to SCS technical sheets. However, the brush control program proposed for implementation on active duneland land type has been planned for mesquite-infested areas which have been specifically identified as supporting grasses which are capable of stabilizing that particular range site. Future production would be expected to double on these sites but has not been included in these projections.

Herbage response following mechanical grubbing depends on the density and composition of grass growing in open areas between mesquite. Brock (1978) found that production of forage plants following grubbing may require two years to reach levels existing before treatment. On the proposed grubbing areas, BLM estimates are that total grass and forage plant production of the 440 acres of grubbing would require five to seven years longer to reach production levels equal to the SCS's "excellent condition" class than would be necessary following aerial spraying.

Grassland areas (brush-free) are expected to improve in production as a result of the benefits to be gained because of the proposed grazing treatments and adjustment of livestock use. By the year 2000, production should be roughly equivalent to production of sites in excellent condition. This improved level of production has already been achieved on portions of Allotments 6038, 5037, and 5057. Potential AUM increases for grasslands within all allotments in the ES area are presented in Appendix 1, Table A-8.

TABLE 3-2

ANTICIPATED PRODUCTION CHANGES FOLLOWING INITIAL CHEMICAL BRUSH TREATMENT ON RANGE SITES WITHIN ALLOTMENTS

(Source: BLM Files)

Allotment				Production[b]		
No.	Name	Range Sites	Acres Treated	Existing (AUMS)	Potential (AUMs)	Increase (AUMs)
6007	Caviness	Deep Sand	1,940	283	647	364
		Sandy	800	23	267	244
		Sand Hills	710	92	237	145
		Gravelly	60	10	15	5
		Loamy	40	3	20	17
		Active Duneland[c]	50	0	0	0
6028	W. Brininstool	Deep Sand	1,920	87	640	553
6037	Diamond and Half	Deep Sand	4,728	551	1,576	1,025
		Sandy	624	70	208	138
		Sand Hills	192	35	64	29
		Gravelly	1,720	54	430	376
		Active Duneland[c]	680	0	0	0
		Limey	96	28	32	4
6038	James	Deep Sand	2,240	665	747	82
		Sandy	840	249	280	31
		Sand Hills	40	13	13	0
		Active Duneland[c]	80	0	0	0
6039	Robbins	Deep Sand	1,760	245	587	342
		Sandy	520	55	173	118
		Active Duneland[c]	720	0	0	0
6040	C. Brininstool	Deep Sand	3,200	503	1,067	564
		Sandy	195	13	65	52
		Sand Hills	280	33	93	60
		Gravelly	60	8	15	7
		Active Duneland[c]	915	0	0	0
7032	Sanders	Deep Sand	4,930	789	1,643	854
		Sandy	370	58	123	65
		Sand Hills	1,050	169	350	181
		Gravelly	20	3	5	2
		Active Duneland[c]	870	0	0	0
7036	Madera & McDonald	Deep Sand	4,112	563	1,371	808
		Sandy	920	115	306	191
		Bottomland	20	3	10	7
		Sand Hills	2,928	406	976	570
7040	Jackson	Deep Sand	7,600	587	2,533	1,946
		Sandy	1,856	120	619	499
		Bottomland	432	12	216	204
		Sand Hills	70	5	23	18
		Gravelly	192	34	48	14
7042	Twin Wells	Deep Sand	2,380	137	793	656
		Sandy	1,440	161	480	319
		Bottomland	460	78	230	152
		Sand Hills	220	13	73	60
TOTAL			54,280	6,273	16,975	10,702

[a] Active duneland (land type) would be treated where it is interspersed with the deep sand, sandy, or sand hills range sites.

[b] Production, as used here, refers to that portion of the total vegetative production that is properly usable for grazing animals.

[c] Designates land types.

Production increases of black grama are expected to occur under the grazing treatments proposed which would provide 16 months', 20 months', or 2 years' rest (a minimum of 115,000 acres). Under the proposed action, black grama would be properly utilized at the moderate-use level (40-60 percent). This is in agreement with Paulsen and Ares (1962) and Valentine (1970) who recommend that annual utilization of black grama be limited to around 50 percent, to assure its sustained production.

Production of dropseeds and most other perennial grasses would increase when plant vigor improves as a result of rest periods provided by all 16-month, 20-month, or 2-year rest treatments. Utilization of forage at the 40 to 60 percent level should allow for continued high vigor. Gradual improvements should eventually attain production levels which are comparable to the SCS "excellent condition" category.

Forb production would be favored under all proposed grazing treatments. The 20-month and 2-year rest periods provide for rest during early spring and summer which are particularly favorable to the production of forbs. These spring rest programs would also prevent cattle from foraging on green forbs as they emerge.

Palatable browse plants (e.g., fourwing saltbush and sand sagebrush) receive heavy livestock use during dry years and in winter. These browse plants would benefit from being rested during one or more growing seasons, every four years. One full year of rest (as provided by the 16-month, 20-month, and 2-year rest periods) can be expected to yield five to seven times more leader-growth on fourwing saltbush than would be possible under continuous livestock grazing pressure (Pieper and Donart 1978). Littleleaf sumac and sand sagebrush should also receive similar benefits, although no data are available for comparison (BLM field observations).

Controlled burns proposed for late winter on 520 acres of tobosa and sacaton grasslands would stimulate production of these two grasses. Burning of old-growth tobosa removes dead plants, stimulating two to three times more production than would have been possible before burning (Wright 1972). However, burning during dry years damages the grass stand and may reduce production to one-fourth of normal. Controlled burns during periods when the soil is damp, relative humidity is 20 to 60 percent, wind velocities are less than 15 mph, and the air temperature is between 60 degrees fahrenheit to 75 fahrenheit results in increased forage production (Wright 1974).

In southcentral New Mexico, Dwyer (1972) found that tobosa production on burned areas remained significantly greater after five years than on areas which had not been burned. Similar results would be expected for tobosa in the ES area. Burning of sacaton is also expected to stimulate production and to encourage livestock and wildlife to utilize an area which had previously contained rank and unpalatable growth (Bock and Bock 1978).

The combined effects of brush control and allotment-specific grazing management programs on a total 961,364 acres would increase forage production in the ES area by 196,543 AUMs, from the existing level of

175,167 AUMs to a future total of 371,710 AUMs. The majority of production increases would be on allotments which would undergo programs to control brush (existing and proposed specific grazing management areas).

Cover

Ground cover consisting of grasses, forbs, and vegetative litter should substantially increase, following brush control programs and implementation of allotment-specific grazing management systems.

Watershed conditions, monitored six years after completion of the 1965 mesquite control program, documented a 100 percent increase of vegetative cover and litter on herbicide-treated areas. Herbicide treatments had killed approximately 40 percent of a heavy mesquite infestation. These treatments were followed by a rest-rotation grazing system. Erosion susceptibility was dramatically reduced, as the result of a 50 percent reduction of bare ground (results summarized in Appendix 3, Table C-2). Similar results are expected on the total 961,364 acres of the proposed brush control project.

Grubbing would remove grass and brush cover from the surface of the sandy range site. Grubbing during dry years would decrease control effectiveness because complete removal of each mesquite plant would be difficult. Wind erosion would increase and the recovery of forage plants would decrease on areas grubbed during dry years.

Wheeled or crawler-type tractors may be used for grubbing mesquite. However, wheeled tractors are appropriate for most soil-vegetative conditions in the ES area. Large rubber tires do not remove grass cover during grubbing operations, although observations in this district indicate that rubber tires on hard, dry soil do have very poor traction. Under such dry conditions, grass cover between mesquite plants would be damaged by the tires. Crawler-type tractors afford the best traction for removing large mesquite plants, but damage grass cover while turning. However, this disturbance could aid rainfall penetration into compacted soil.

The proposed grazing treatments favor the accumulation of vegetative litter and cover. Increases in plant cover on brush-free ranges result from improved plant vigor, the immediate consequence of rest during growing season and moderate utilization of forage. The benefits of improved plant vigor were noted by Cook and Goebel (1962) where desert intermountain grasses in good vigor covered three times more surface area than the same species in low vigor.

The intense competition between heavy brush stands (e.g., mesquite, shinnery oak, and creosote) and perennial grasses for soil water causes depressed grass vigor. In brush-infested areas, the pressure placed on palatable grasses by grazing livestock further depresses grass vigor. Therefore, where brush is not controlled, (approximately 500,000 acres) both the vigor of plants and the amount of ground cover are expected to either decrease or remain static, even with optimum grazing rest periods of 16 months, 20 months, or 2 years.

Increases in the grass cover would help retard future invasions of brush. Studies in southern Arizona showed that vigorous stands of perennial grasses reduced the establishment of velvet mesquite seedlings by over 90 percent (Glendening and Paulsen, 1955). Sixteen times as many seedlings were established on bare ground as in dense grass stands. Scifres, et al. (1971), reported on the status of a livestock exclosure which contained 2,950 honey mesquite seedlings when established in 1941. Twenty-seven years later, the exclosure contained a dense stand of near-climax vegetation composed of tobosa, vine mesquite, and buffalograss. Only 400 mesquite plants survived the changes in range condition following removal of livestock. These data suggest that invasions of mesquite seedlings may be deterred on low-lying sites which have a dense growth of forbs and grasses, if they are properly managed.

No Specific Grazing Management

Specific grazing systems would not be required on 74 allotments (76,822 acres of public land within the ES area). Stocking rates would be based on range survey data with monitoring of forage utilization.

Range condition and AUM production would remain unchanged on all these allotments because most operators would maintain their existing management schemes (Chapter 2, Table 2-1 summarizes existing and potential conditions on "no specific grazing management" areas). Twenty-three of these allotments (20 percent) are presently in good condition because allottees voluntarily provide some growing season rest or maintain light grazing pressure.

Areas infested with mesquite, creosote, or shinnery oak would gradually deteriorate because control of brush is not proposed on these allotments. There are no springs, ponds, or playas on the public lands located on these 74 allotments.

Problems with poisonous plants would not change on these allotments after the proposed action is implemented. Shinnery oak, broom snakeweed, cocklebur, nightshade, and locoweed would continue to plague livestock in spring. Similarly, threadleaf groundsel and rayless goldenrod would continue to be problems in summer and fall.

Livestock Exclusion Areas

Under the proposed action, 6,575 acres would be excluded by fencing from livestock grazing. Exclosures would be designed to establish favorable wildlife habitat conditions which are associated with mixed desert shrub, bluestem communities, broadleaf tree groves, black grama grasslands, riparian zones, dirt tanks, and playas. The largest exclusion area (25 exclosures, each totaling 160 acres, for a total of 4,000 acres) would include shinnery oak/bluestem/dropseed areas in eastern Chaves County. One exclosure, the Mathers Natural Area (91 acres), already exists and was established where grazing pressure was already very light or nonexistent. This area already has good grass plant density. Its production of bluestems and other palatable forage grasses is good and there is only a light stand of shinnery oak. The light density of shinnery oak probably exists because grazing pressure was never severe enough to reduce grass density. The light density of existing shinnery oak stands may be held in check by the hardy stands of perennial grasses.

Exclosures proposed where shinnery oak density is light (approximately 480 acres) should resemble the Mathers Natural Area. Livestock exclusion areas would allow bluestems and other palatable forage plants to remain in good vigor. No significant changes in composition or density would occur.

Approximately 3,520 acres of the total proposed for shinnery oak/bluestem/dropseed exclosures are in fair or poor condition and contain moderate to heavy stands of shinnery oak. These high densities of shinnery oak are probably the result of years of severe livestock use on bluestems and other palatable grasses. The vigorous, spreading nature of shinnery oak suggests that this shrub will not decrease in density because of competition from forage species even if there is little or no use by livestock. Steady increases in shinnery oak densities have occurred on areas which had undergone heavy grazing in the past and would continue even under moderate stocking pressure (Roswell District files). BLM range conservationists assume that grass vigor would improve on exclusion areas, but that grass densities would not increase because of intense competition from shinnery oak.

Two 50-acre exclosures would prevent use of black grama grassland areas by livestock. Black grama and other palatable grasses should increase in vigor and production following exclusion of livestock. Vegetative litter would accumulate, providing more soil cover, thereby increasing soil moisture for plant growth. These improvements would occur initially as conditions over the long-run become static.

Brown and Schuster (1969) examined grazed and ungrazed vegetation on the Caprock, approximately 125 miles east of the study area. Ungrazed areas had a more diverse composition of species and produced more high quality grasses than did adjacent areas where grazing was permitted. Without the influence of grazing, rainfall infiltrated into soils more successfully and these soils had a higher level of organic matter. Exclusions of livestock over long periods could produce similar soil vegetative responses on the black grama ranges of Lea and eastern Chaves Counties.

However, exclusion of livestock might not benefit vegetation without such stimuli as fire. In central Texas, after 25 years without livestock grazing, vegetative production and litter accumulations were less than in pastures which had been moderately or lightly stocked (Reardon and Merrill 1976). Changes in the vegetative composition appeared to have been an adjustment in the proportions of species which were present, rather than a change in the number of species (Smeins, et al., 1976). Observations in the ES area have indicated that short-run periods of high vigor and production occur after natural stimuli such as drought, followed by heavy rain.

Exclosures containing mesquite are expected to decline slowly or remain in a stable condition. One mesquite/dropseed area in west Eddy County was evaluated 15 years after livestock were excluded. Removal of livestock had allowed the vigor of grasses to improve and to produce more grass. Vegetative litter was three times greater on ungrazed sites, but there was little increase in vegetative density (Appendix 3, Table C-2). Densities of grass plants would not be expected to change within proposed mixed desert shrub exclosures (80 acres). Unless forbs and grasses become very dense, brush seedlings would become established during wet growing seasons, following severe drought. The spread of creosote would not be retarded by grass but would spread and establish from any adjacent infestations. As infestations of brush increase, vigor and production of grasses would decline.

Aquatic vegetation associated with exclosures on playas (35 acres) and dirt tanks (16 acres) would undergo long-run improvement in the absence of livestock grazing and trampling.

Protected riparian areas (approximately 3,400 acres) and broadleaf tree groves (17 exclosures totaling 50 acres) would allow brush, tree, and forb seedling to become established. Tree groves would gradually expand into adjacent habitat. Changes in herbage composition would favor the more palatable plants with a decrease of those forbs (e.g.: cocklebur and broom snakeweed) which invade disturbed sites.

Improved plant vigor, following exclusion of grazing, would yield increased amounts of vegetative litter and standing dry forage. This biomass would buffer fluctuations in the soil surface microenvironment (Whitman 1971). Soil surface temperatures and moisture content would not fluctuate as radically as in adjacent grazed areas. These conditions would be favorable for grass growth unless a dense mulch accumulated on the soil surface.

Increased amounts of dry forage would create a wildfire hazard. Such fires would cause a short-run loss of both brush and herbage within the exclosure. However, wildfires would also help control noxious brush plants and would stimulate grass production.

Summary and Conclusion

Ninety-five percent of the ES areas public lands (about 1,516,000 acres) would receive periodic spring and summer growing season rest. Each year at least 538,750 acres (about 36 percent of the ES area) would receive summer rest and 407,000 acres (about 27 percent of the ES area) would receive spring rest from livestock grazing. Any given acre would be rested during the summer growing season about one out of every three years and during the spring period one out of every four years. This rest allows spring and summer growth on forbs and other forage plants to regain vigor and become established with full vegetal development. This spring and summer growing season rest would be applied to approximately 87 percent of the area presently in poor condition, and 96 percent of the area that is in fair condition. Based on apparent trend information gathered in 1977, about 90 percent of the area that is in a downward trend would receive rest.

Historically, the ES area's vegetation was grassland, not the mesquite, creosote, and shinnery oak aspects which now dominate. Invasion of these shrub species has created a highly competitive situation between themselves and the native grass species for soil moisture. Forage production is about one half of its potential because of this competition. The majority of the soils on these acres have a high susceptibility to wind erosion, when cover is removed. The area experiences high daytime temperatures (exceeding 100 degrees fahrenheit for periods up to 2 weeks) and high evapo-transpiration rates. Precipitation is often intensive and highly localized, with droughts being frequent and severe. Ecological conditions indicate that the area is in the first steps of desertification. However, this situation can be turned around.

There are positive elements in the environment. The majority of the precipitation (80 percent, about 9 inches) falls during the spring and summer growing season. Soils generally have a high to moderate water-holding capacity which is available for plant use. Seed sources and residual plants of desirable forage plants are present in protected areas and scattered throughout the area for reestablishing a grass cover. The total growing season is relatively long (April through October) and growth can take place at anytime during that period when moisture is available. With the removal of competition from the mesquite and creosote brush species for soil moisture, forage plants would be able to respond.

Following brush control treatments, this competition would be removed on 961,364 acres. A brush kill of only 30 percent is considered to be a successful treatment and would reduce competition sufficiently to allow dramatic forage plant response (Leifeste 1971). According to Dr. Pete Jacoby of Texas A&M University and Dr. Carlton Herbel of the USDA in Las Cruces (both herbicide specialists), an average kill of 40 percent can be expected following treatment; and there would be virtually no detrimental impact on plants other than mesquite or creosote.

With a release from competition for soil moisture, an adjustment in stocking rates to the proper use level (moderate), and scheduling of rest during the growing season, forage plants are expected to respond and continue an upward trend until the production potential for the site has been reached (in 3-5 years). See Table 2-2 in Chapter 2 for anticipated changes in condition and apparent trend. Table A-4 in Appendix 1 shows potential production by allotment. Experience in the ES area with brush control projects similar in nature to this proposal and recorded by Leifeste in 1971 shows that these results are attainable.

In conclusion, an overall long-term improvement in range condition and forage production can be expected on the 961,364 acres proposed for brush control treatments, with conditions being maintained or slightly improved on all but 21,000 acres (primarily sand dunes and barren areas) of the remaining 628,636 acres.

Expected changes in range condition are displayed as follows:

Range Condition (Acres)		
Class	Present	Future
Good	352,000	1,306,000
Fair	1,169,000	255,000
Poor	48,000	8,000
Barren areas	21,000	21,000
Total	1,590,000	1,590,000

Forage production (100 percent of which would be properly usable for grazing) would be expected to change from the 175,167 AUMs at the present time to 371,710 AUMs by the year 2000. Total vegetative production (more than twice the amount of properly usable forage. See discussion on "proper use" in Appendix 1) would be expected to increase by approximately the same amount although a change in composition resulting from brush control treatments would reduce the amount of total increase.

THREATENED OR ENDANGERED PLANTS

The proposed action would have no impact on the three forb species which have been proposed for inclusion on the federal list of threatened species. Because of their unpalatable nature, properly managed livestock grazing would not threaten these plants. Aerially sprayed herbicides would kill these forbs if they are growing in treated areas, however, Bureau policy would prevent such treatment. Exclusion of livestock is not expected to have detrimental effects on *Proboscidea sabulosa*. Excluding livestock has not been detrimental to *Phacelia integrifolia* var. *texana* or *Limonium limbatum*, at the Bottomless Lakes State Park.

SOILS

Chemical Brush Control

Approximately 961,364 acres of the ES area's soil resources are expected to be treated with a mixture of two herbicides, picloram or dicamba. Initially, approximately 54,000 acres would be treated with these two herbicides on areas infested by mesquite. Most of the herbicide sprays would also reach the soil surface with a portion of the herbicide infiltrating into the subsurface, along with rainwater. After penetrating the surface, it would translocate as far as the new water would wet the soil, following rainfall (Scifres 1975). Once in the soil profile, dicamba and picloram undergo decomposition and dissipation. Mechanisms for their dissipation are: 1. decomposition by microorganisms, 2. chemical decomposition, 3. absorption to the soil colloid, 4. leaching, 5. volatility, and 6. photodecomposition (Scifres 1975). Dicamba is very susceptible to decomposition by microorganisms and dissipates quickly. The half life for dicamba is approximately 25 days (Scifres 1975). Effects of this herbicide would not be expected to persist for more than a year after application. Microorganisms decompose picloram more slowly. Picloram's half life is estimated to exceed 100 days (Scifres 1975). One study on sandy rangeland soils shows that picloram had dissipated to trace amounts 112 days after application (Scifres, McCall, Maxey, and Tai, 1977). This herbicide would be expected to decompose or dissipate from the soil within approximately two years after application.

The diesel fuel used as a carrier for the herbicide would not be expected to have harmful impacts. At an application rate of two pints per acre as proposed, only about one-half of the applied diesel fuel would reach the soil surface. The remaining portion would either land on present foliage or volatilize back into the air. Once on the surface, most of the fuel would evaporate because the soil temperatures during the day reach as high as 150 degrees.

The amount of fuel that does not evaporate would infiltrate into the soil profile. Diesel fuel is biodegradable and the residue is not expected to last for very long. The impact of diesel fuel on soils is expected to be minor and of short duration.

There are no harmful impacts to soils expected from applications of dicamba or picloram at the prescribed rates. Residual persistence would be of short duration and herbicides would not be expected to accumulate in soils from follow-up applications of these herbicides in future years.

Chemical treatments would have a short-run negative impact. After the chemical treatment kills the mesquite plants and they are defoliated, erosion would increase on soils which are presently stabilized, allowing wind and water erosion to increase. The greatest effect would be on soils of the high and very high soil-blowing hazard groups (WEG 1, 2, 3, 4, and 4L) approximately 1,531,000 acres. A moderate soil-blowing hazard exists with the soils in the moderate and slight soil-blowing hazard groups (WEG 5, 6, 7, and 8) approximately 64,000 acres. Dunes which are presently stabilized by mesquite growth could be expected to undergo a physiographic change after the mesquite defoliates and dies following chemical treatments. These soils would then be expected to drift under the effect of winds, tending to level some dunes. Grasses and forbs would become reestablished and would exceed pretreatment production levels within two to three years. In the long-run, vegetative ground cover would increase, which would decrease soil erosion.

Mesquite is expected to be removed from a total of 440 acres in the ES area by root knives and other mechanical equipment. This form of removal would severely disturb the soil surface. Areas and acreages involved in mechanical removal treatments are listed in Appendix 1, Table A-5. Wind and water erosion could be expected to increase because the bare soil surface would be exposed and because acreages to be treated are in the sandy range site where soils are in the high soil-blowing hazard groupings.

After treatment, wind erosion could be severe and is expected to last through two growing seasons. Vegetation would be expected to become reestablished within two growing seasons. Over the long-run, soil productivity and vegetative ground cover would increase, decreasing soil erosion.

Burning of grassy draws on 520 acres would also be expected to have an impact lasting for four to five months. Burning would expose soils to wind and water erosion and the soil chemical complex would change because of nutrients released by burning vegetation. This chemical change would be difficult to quantify, because of the unknown losses through wind and water erosion. This impact would be extremely localized and the cumulative effect would be small because vegetation could be expected to recover within four to five months. In the long-run, there would be virtually no change in soil erosion rates. Vegetative ground cover would be expected to return to the same levels existing before burning.

Specific Grazing Management

Soils in southeastern New Mexico tend to be strongly affected by both wind and water erosion. However, allotment-specific grazing management systems with their associated land treatments could be expected to contribute towards a reduction in the effect of these problems. Vegetative ground cover would be expected to increase under the proposed action. As a result, BLM estimates are that a 20 percent increase in ground cover would occur throughout the area. This would decrease the forces of both wind and water erosion on the soil surface as proposed management systems are implemented.

Increased vegetative cover and litter would also decrease the effects of water erosion and would tend to slow surface run-off and velocities while shielding the soil surface from the impact of raindrops during thunderstorms.

Present erosion condition classes within the ES area have been developed, based on soil surface factors. At the present, approximately 48,000 acres are in a stable condition, an estimated 830,000 acres are in a slight erosion condition, while about 602,000 acres are in a moderate erosion condition. BLM estimates are that 111,000 acres are in a critical erosion condition, and about 1,600 acres are in a severe erosion condition.

Wind erosion would have the greatest effect on very sandy soils which have low wind erodibility group ratings, e.g.: groups 1, 2, 3, 4, and 4L (very high and high soil-blowing hazards) approximately 1,531,000 acres. Soils in groups 5, 6, 7, and 8 (moderate and slight soil-blowing hazards) approximately 64,000 acres would experience only minor impacts.

The effects of water erosion are explained in Appendix 2, Table B-5, which shows the changes in sediment yield resulting from implementation of the proposed action. Table B-4 in Appendix 2 shows reductions in sediment yields and sediment yields for range sites in the year 2000. By that year, water erosion rates would reduce in most areas by approximately 20 percent on approximately 1,489,000 acres in the ES area. Of the 15 soil series which are presently in the moderate erosion class, 8 would be in the slight erosion class by the year 2000. Erosion rates would be reduced on most range sites after implementation of grazing systems. Gyp hills and breaks, gyp upland, hills and breaks, range sites, and the rockland, badland, and waste land types would continue at the present erosion rates. These sites would continue to produce large amounts of sediment because of their steep slopes and geologic characteristics. These problem areas are graphically displayed in Visual E which shows the range sites. A decrease in wind and water erosion would be beneficial.

No Specific Grazing Management

On the areas where specific grazing management is not proposed, vegetation would be expected to remain much the same as at present in areas of nonspecific grazing management. Sediment yields would continue at the present rate. Some areas (4 allotments) which are in a downward vegetative trend could be expected to undergo increases in erosion rates because of reductions in vegetative ground cover.

Exclusion of livestock from areas identified in Chapter 1, would have a long-run beneficial impact on soils. Without the effects of livestock grazing and the resultant trampling; vegetative ground cover could increase, protecting soils and contributing to a decrease in wind and water erosion. Soils in the 91-acre Mathers area (Roswell and Jalmar soil series) are expected to erode at the present rates because this area is already excluded from livestock use.

Within those 1,885 acres of the Mescalero Sands which already are set aside as exclusion areas, the soil series are Roswell, Jalmar, and Duneland land types. The Roswell and Jalmar soil series would be expected to decrease their sediment yield while the soil type which makes up a majority of the area (Duneland) is not expected to change its erosion rates (Table B-5 in Appendix 2). Duneland soil types are essentially devoid of vegetation and livestock exclusion is not expected to affect ground cover. Sediment yield is expected to continue at the present rate for this soil type.

Livestock Exclusion Areas

Livestock would be excluded from 6,345 acres of the Chaves County portion of the ES area to allow for prairie chicken habitat. Soil series in the affected areas are: Roswell, Jalmar, and Faskin. These series are expected to decrease in sediment yields. Table B-5, Appendix

II shows the expected decrease in sediment yields of Roswell, Jalmar and Faskin from livestock exclusion. All of these sediment yields were estimated using the PSIAC method for analysis purposes only and were not developed as a result of actual measurement of sediment yield. They indicate relative ranges of values and are considered valid in identifying trends. A discussion of the Pacific Southwestern Interagency Committee (PSIAC) method is presented in Appendix 2.

Facilities

Construction of 246 livestock watering sites (approximately 125 acres) would have only a small impact on soils. The amount of area disturbed would be far less than one percent of the total ES area. Soil erosion would occur from construction disturbances and concentrated livestock trampling. Top soil would be lost from these sites but the sites could recover in future years, if the stock usage were removed.

Construction of 203 miles of proposed fence could be expected to have a short-run (two growing seasons) impact on the area's soils. About 175 acres are expected to be disturbed with most of this disturbance being caused by vehicular traffic during the actual construction. Erosion rates would be expected to return to normal as vegetative coverage returns to preconstruction amounts (approximately two growing seasons). Since the acreage disturbed is expected to be far less than one percent of the total ES area, impacts are expected to be slight.

Summary and Conclusion

Residues from herbicide treatments would affect about 54,000 mesquite-infested acres initially. Subsequently 907,364 acres would also be affected as treatments continued, for a total of 961,364 acres over a 20- year period. These residues would dissipate within two years after application. Impacts to soils as a result of herbicide applications would be minor and short-run (2 years).

In the areas of allotment-specific grazing management, (approximately 1,516,000 acres) the present water erosion rate results in a soil-loss of approximately 1,037 acre-feet per year. Because of the projected increase in vegetative cover on these 1,516,000 acres by the year 2,000, annual erosion rates to be expected would be 809 acre-feet of soil. On the remaining 79,695 acres, sediment yields would continue at the present sediment rates, because cover is not expected to increase. Most of this sediment yield would be from onsite erosion, and soil movement would usually be over a short distance due to nearly level slope. Ninety-five percent of the ES area is a closed basin and very little sediment would leave the area.

In conclusion, impacts to soils from the proposed action would result in about a 22 percent decrease in wind and water erosion in the ES area.

AIR QUALITY

Air quality within the ES area would be affected by the volatility of herbicides proposed for use. These herbicides are usually available in three kinds of formulations: esters, salts, or acids. Esters tend to volatilize and drift when used in spray applications. Air pollution would be minimized because, under the proposed action, acid or salt formulations would only be used with a droplet size of from 200 - 400 microns. This size would minimize both volatilization and drift.

There are two primary modes of herbicide dissipation from the atmosphere: herbicide drift and volatility. The hazard of herbicides drifting during aerial spraying operations would be related to weather conditions during spraying, distance that droplets must fall, and the size of droplets. All are specified in the proposed action (Chapter 1). The greatest potential for reducing drift hazards would be through reduction or elimination of drift-susceptible droplets (less than 100 microns).

The second mode of dissipation, volatility, is the tendency of a liquid to vaporize or turn to a gas. Que Hee and Sutherland (1975) reported that relative volatility was also related to droplet size. In general, herbicide droplets below 200 microns tended to volatilize faster. The reverse was also true with droplets above this size, emphasizing the need for droplets to be at least 200 to 250 microns in size and that sizing must be consistent.

While the amount of herbicide drift and volatilization which would be necessary to pollute the atmosphere would be difficult to estimate, such pollution is not expected to occur in the ES area. BLM estimates are that herbicide concentrations would be less than 5 percent and would be dissipated in 48 hours or less.

Summary and Conclusion

Herbicide applications for control of brush are not expected to adversely impact air quality in the project area.

WATER QUALITY

The use of herbicides presents a possible problem of polluting an area's water resources. However, the nature of herbicides proposed for use in the area negates this possibility. Norris and Montgomery (1975) state that dicamba is one of the most mobile herbicides in soil. They add that entry into the soil profile reduces the probability of the herbicide entering streams by overland flow, except during the first intensive storms following application.

Evidence obtained by monitoring streams, following the application of dicamba, led Norris and Montgomery (1975) to conclude that dicamba posed no serious hazard to aquatic organisms or to water users downstream. They also stated that the short persistence of this herbicide in water would prevent chronic exposure. Dicamba can be used for control of brush on forest lands with little or no impact on aquatic environment, according to Norris and Montgomery (1975), if direct application to surface water is minimized through the use of appropriate spray application techniques (see Chapter 1).

Since the dimethylamine salt of dicamba's acid is quite soluable in water, photodecomposition might be one of the ways that breakdown in water occurs. Uptake by stream or pond vegetation and ultimate metabolism by the plants would also contribute to clearing an area's water of the chemical. However, precautions should be taken to avoid contamination of waterways, ponds, or lakes (Velsicol Chemical Corporation, 1971).

Dissipation of dicamba was studied by Scifres, et al. (1972), under field and laboratory conditions. This herbicide dissipated more rapidly from pond water under nonsterile lighted conditions than under dark, sterile conditions. Pond sediment evidently contained populations of microbes which were capable of decomposing the herbicide. Temperature was crucial in the dissipation process, especially in pond sediments, indicating the important role of microbes. The influence of microbes on dicamba's dissipation rate was apparently augmented by light in some cases. Under summer conditions, applications of dicamba on ponds at four pounds per acre of surface area dissipated at about 1.3 parts per million (ppm) per day.

Norris, et al. (1976a), reported that no picloram residue was found (minimum detectable level 0.1 parts per billion) in streams flowing across treated powerline rights-of-way despite intensive sampling with automatic equipment for periods in excess of six months after application. The authors conclude that the lack of residues in stream water is consistent with the relatively short persistence and limited mobility of this herbicide in the environment.

Norris (1969) noted that, in an area where 67 percent of a watershed was sprayed in August, residues up to a maximum of 0.078 ppm were detected after the initial one-inch rainstorm but decreased thereafter. No residues were found after late October or in areas where only a small portion of the watershed was treated.

Norris, et al. (1976b), studied the level of picloram contained in rainwater run-off from a 16-acre hillside pasture watershed in southern Oregon. The entire watershed was sprayed in June with two pounds of picloram per acre, including the dry stream's channel. There was no water in the stream until October when the first two rainstorms caused limited wetting of the channel and filled the pools, but caused no outflow from this gauged watershed. Maximum picloram concentration was about 0.1 ppm. The first rainwater to flow from the watershed carried some herbicide, but the concentration was low, 20 parts per billion (ppb). No picloram was detected after January.

About 0.28 percent of the picloram applied to the watershed appeared in streamflow during the three-year study. The dry stream channel accounts for 0.21 percent of the area of the watershed. The authors concluded that the outflow of herbicide largely represented movement of residues applied in and near the dry stream channel.

Baux, Bovey, and Merkle (1972) treated a 20-acre watershed with one pound per acre of picloram for two consecutive years. They sampled run-off water in adjacent creeks within 1.2 miles of the plots. Directly adjacent to the plots, the concentration of picloram in run-off water declined to less than 10 ppb within 10 to 12 weeks after application. Eight days after application, water samples 0.7 miles from the plots contained less than 1 ppb. One part per billion (1 ppb) was occasionally detected one mile from the plots within 8 months after treatment.

Research conducted in semiarid to subhumid environments indicated that picloram dissipated from impounded natural water sources within 4 to 6 weeks after its introduction (Haas, et al., 1971). However, 1 to 2 ppb. were detectable a year after application of 1 lb./acre of picloram. Once the herbicide was moved into water catchments in the Rolling Plains, residues were also detected for at least a year following treatment (Scifres, et al., 1971). In no case did treatment of areas adjacent to domestic water wells (30 to 150 deep) result in detectable residues of the herbicide in those wells (Bovey and Scifres, 1971). Evidently, dilution is important in the dissipation of picloram from impounded waters. Photodecomposition is probably important in reducing concentrations of this herbicide in water (Bovey and Scifres, 1971). Bovey and Scifres (1971) assumed that certain levels of light energy were probably necessary for degradation of each molecule to activate the light-induced chemical decomposition of picloram. Interception of photons of light by picloram molecules would be expected to occur randomly. In such a system, degradation of these molecules would be expected to occur rapidly at first then decrease as fewer molecules were available to intercept light.

Summary and Conclusion

Ninety-five percent of the ES area is in a closed basin and virtually no herbicide residue carried by run-off would be expected to enter streams. The persistence of dicamba and picloram is usually only a few days but is a function of the hydrologic nature of the area treated. There would be no contamination of ground water according to results of studies by Bovey and Scifres (1971).

In conclusion, the proposed action would have virtually no effect on water quality.

WATER PRODUCTION

Most new water development would come from ground water supplies, and would amount to 99 new acre-feet of ground water withdrawal. The current ground water consumption for all uses is 260,960 acre-feet (Chapter 2), and the effect of the proposed new withdrawals would be insignificant (an approximate 0.04 percent increase).

Since 80 percent of this ES area exhibits a lack of drainage network development and 95 percent of the area is in a closed basin, increased ground cover (Chapter 3, Vegetation) would have no measurable effect on surface run-off. Integrated drainage channels having earthen rentention dams would, theoretically, reduce available run-off. Increased ground cover would also reduce localized water run-off, but the overall effect would be less than 1 percent. This would indicate that much of the area has good infiltration characteristics which would enhance ground water recharge. Even when dissolved solids total less than 1 percent, theoretically, this level would be reduced even more when ground cover increased, and when livestock are excluded. In conclusion, there would be virtually no impact on water production.

WILDLIFE

Major components of the proposed action will be analyzed as they affect the following groups of animals and their habitat: aquatic wildlife (fish, amphibians, reptiles, birds, mammals, arthropods, and gastropods), terrestrial wildlife (amphibians, reptiles, birds, mammals, arthropods), and both threatened or endangered wildlife. The effects of herbicides on humans will also be discussed under the "Brush Control with Herbicides: Chemical Effects" heading.

Chemical Brush Control

Aquatic Wildlife

Herbicides can be acutely toxic if concentrations in the aquatic environment reach dangerous levels. These levels are variable, depending on such factors as the acidity or alkalinity (pH), the amount of various dissolved salts in the water, water temperature and oxygen content, and the flow level. While these elements affect the aquatic habitat, all anticipated impacts affecting aquatic organisms would involve toxic concentrations of herbicides in the water. Additional information would be required to identify impacts resulting from less severe levels of herbicides on aquatic organisms and their habitats. Without such information, it is impossible to speculate on long-term impacts to the organisms or their habitat.

The Environmental Protection Agency (U. S. EPA 1-77) has determined that several factors influence impacts to aquatic organisms in stream environments:

1. Concentrations of herbicides change slowly in large streams with the result that a greater chance for chronic exposure occurs from a given concentration.
2. Large streams which have higher concentrations of herbicides would carry larger amounts of these chemicals into the next larger streams than would the smaller feeder streams having the same levels of concentration, thus creating more general pollution problems for a given level of contamination (U. S. EPA 1977a).

3. High levels of contamination in large streams offer organisms little opportunity for escape.

4. Organisms living in larger rivers which have high levels of contamination have the greatest danger of these herbicides being concentrated in their systems.

Table 3-3 presents data concerning observed toxic levels of herbicides, by aquatic organism, based on laboratory studies. In view of the fact that laboratory data may not apply directly to field conditions and that organisms tested may not indicate general tolerance levels for all aquatic organisms, researchers have recommended that maximum stream concentrations not be allowed to exceed those levels which have been determined to be toxic for the most sensitive aquatic organisms.

Data presented in Table 3-3 indicate that concentrations of most herbicides would probably need to exceed concentrations of 100 parts per million (ppm) before they would become lethal for those aquatic organisms tested.

However, the level of 100 ppm is not likely to be reached, due to the low application rates, observance of buffer strips during spraying, and the small chance that lethal concentrations of herbicides would flow overland, following thunderstorms (See Water Resources for a discussion of herbicide persistence in water).

Different species of fish can tolerate a variety of water temperature and herbicide levels in their habitat with these tolerance levels increasing as the water or stream temperature increases. For example, the level of picloram which will kill half of a test population of rainbow trout (the LD$_{50}$) is as low as 150 ppm, while the green sunfish can tolerate 420 ppm (Pimental 1971). The primary aquatic habitat for this ES area is the Pecos River, a warm water fishery supporting aquatic wildlife which tolerates relatively high stream temperatures.

Studies which have investigated picloram and dicamba (Table 3-3) have shown that these chemicals have a low order of toxicity to warm water fish. However, snails and insects react to relatively low concentrations of both herbicides and there is some concern because the effect of a long-term exposure of aquatic animals to these herbicides is unknown. Although data was unavailable to assess this impact, studies have shown that dicamba (Sanborn 1974) and picloram (Scifres, et al., 1977) break down rapidly in aquatic environments and in the sandy rangeland soils which are typical of the ES area.

The danger that these herbicides would be retained within the tissues of wildlife and become concentrated to toxic levels over time (bioaccumulation) does not appear to be great. Studies conducted by Morre' in 1974 noted that both dicamba and picloram did not "bind" to animal tissue.

Both dicamba and picloram are produced without creating the chemical side effects known as "dioxins" which have been found to be extremely deadly in aquatic environments, even in small concentrations (Miller, et al., 1973). This was found to be particularly true of the dioxin TCDD, according to this report.

Reptiles, amphibians, and other organisms which have limited mobility may not be able to avoid herbicide treatments. Quantitative data is lacking as to the impacts of herbicides on these vertebrates, however, buffer zones along streams provide some protection for aquatic animals while most amphibians and reptiles live beneath some form of protective cover which intercepts most of the spray.

TABLE 3-3
EFFECTS OF PICLORAM AND DICAMBA ON ANIMALS: TOXIC LEVELS AND STUDY RESULTS
(Source: See References)

Chemical	Animal	Dosage	Effects	Conclusion of Study	Reference
Picloram	Fish	Unspecified dosage	Esters are more toxic than salts.	Picloram presents low potential hazard to fish with recommended use.	Sargent, et al., 1970
Picloram	Green Sunfish	LC 50 = 150 ppm.	Half the test population died.	None	Weimer, et al., 1957
Picloram	Mallards Pheasants	LD 50 = 5,000 mg/kg LD 50 = 5,000 mg/kg	Half the test population died. Half the test population died.	None	Heath and Others, 1970
Picloram	Rat Mouse Rabbit	LD 50 = 8,200 mg/kg LD 50 = 2,000 mg/kg LD 50 = 2,000 mg/kg	Half the test population died. Half the test population died. Half the test population died.	None None None	WSA, 1967
Picloram	Snails	380 ppm. 530 ppm.	No mortality 100% mortality	None	Lynn, 1965
Picloram	Stonefly nymphs Amphipod (Gammarus lacustris)	LC 50 = 120 ppm. 48 hr. LC 50 = 48,000 ppb.	Half the test population died.	None	FWPCA, 1968
Picloram	Mice Rats	80 week study. Doses = 5,062 ppm. 80 week study. Doses = 14,875 ppm.	No effects Benign lesions in females	Picloram is not carcinogenic	National Cancer Inst., 1978
Picloram	Fish	Maximum solubility with water	Specific effects not listed.	Low toxicity to fish.	Morre', 1974
Dicamba	Honeybee	LD 50 = 3.6 mg/bee	Half the test population died.	Bees are extremely sensitive.	Edson and Sanderson, 1965
Dicamba	Bluegills (fish)	LC 50 = 130 ppm.	Half the test population died.	Warm water species are more tolerant.	Bohmont, 1967
Dicamba	Pheasant (male) Pheasant (female)	LD 50 = 800 mg/kg LD 50 = 673 mg/kg	Half the test population died. Half the test population died.	None	Edson and Sanderson, 1965
Dicamba	Amphipod (Gammarus lacustris)	48 HLC 50 = 5,800 ppb.	Half the test population died.	None	FWPCA, 1968

LC - Lethal concentration of chemicals in animal tissue.
LD - Lethal dose given orally to an animal.
HLC- Lethal concentration of the chemical in animal tissue that will cause death in a given number of hours.
Mg/kg - Milligrams of liquid per kilogram of body weight.
PPB- Parts per billion.
PPM- Parts per million.

Terrestrial Wildlife

Necessary data was not available to evaluate the effects of dicamba and picloram on reptiles. Since both herbicides are of low toxicity to fish and higher orders of animals, a reasonable assumption is that reptiles would not be adversely affected.

Herbicides are less toxic for birds than are pesticides (Hill, et al., 1975), however, literature concerning the effects of herbicides which would possibly cause injury but not death for birds, is limited to those which are not now being used on the public lands. However, in 1976, Beaver found that birds shifted their diets from food sources which had been treated with herbicides and used alternative foods. Table 3-3 shows levels of toxicity for these herbicides to birds. Overall, these toxicity levels are low since they do not accumulate (bioaccumulate) in the tissues of birds (Morre' 1974). Concentration levels required for these two herbicides to kill half of a test population of pheasants were relatively high, with picloram requiring 5,000 milligrams per kilogram (mg/kg) and dicamba 800 mg/kg.

A mixture of diesel fuel and water would be used as a carrier for these herbicides. While data concerning the toxicity of diesel fuel on wildlife is limited, a few studies have been conducted as to the adverse effects of this fuel on ducks. Amounts of diesel fuel that are greater than 20 milliliters per kilogram (20 ml/kg) have been shown to kill more than half a test population of male and female mallards, over 12 months of age, when this fuel was ingested orally (Tucker and Crabtree 1970). In their study, none of the animals died at the highest dosage given (20 ml/kg). For healthy white ducks, the oral dosage necessary to reach a 50 percent kill rate (LD_{50}) was found to be greater than 24 ml/kg (Hartung and Hunt 1966). This quantity is far higher than a duck would consume with foliage sprayed during a normal rangeland application of herbicide. A bird may also ingest some diesel fuel by preening itself after being exposed to the spray. According to these studies, it was found that, through preening, a duck ingested about one-third of the fuel oil sprayed on its feathers (Hartung 1965).

Considering the small amount of diesel fuel proposed for use as a carrier in these sprays (two pints in every two gallons of solution per acre), negative impacts would be minimized. However, accidents can happen and such accidents could adversely affect the chances of any eggs hatching which received a heavy dosage of diesel fuel. An oil coating on eggs will block gas exchange through the shell and the embroyo will die. In one study, 57 viable pheasant eggs were sprayed with diesel fuel until it ran off the shell. None of the eggs hatched (Kopischke 1972). This was a far higher amount of spray than the eggs would have received in a normal application. In another study, fertile chicken eggs were sprayed with diesel fuel at the rate of ten gallons per acre and none of these eggs hatched. Further studies showed that simply coating the large end of an egg with diesel fuel was enough to kill the embryo (Keith 1964).

Mid-May until July 1 is a critical period for both wildlife and for treatments to control brush. Aerial applications of herbicides are most effective on mesquite foliage at the time birds in the ES area are nesting. Adherence to 300-yard buffer zones around raptor nests would protect birds of prey and their nests. However, ground-nesting birds such as horned larks and meadow larks would be susceptible to feather-wetting because protection offered by such nesting materials as grama grasses, threeawns, and tobosa would not be tall or dense enough to intercept all the spray. However, if nests are aborted, most birds will renest, especially the ground-nesters, although late-season nesters probably would not, if they are disturbed. Any bird which accidentally receives a complete soaking during herbicide applications would probably lose the ability to fly. This loss would subject the bird to becoming the prey of predatory animals. A secondary, but important impact of diesel fuel on the feathers of birds would be a loss of structure caused by matting. Birds which flush or fly directly beneath an aircraft during spraying would possibly receive a complete wetting. Matted feathers provide no insulation, thus a bird can become susceptible to rapid heat loss (hypothermia). The greatest danger for birds would be in early spring, because of the cool weather which occurs during that season.

There is, however, a combination of factors which reduce the possibility of birds being contaminated with diesel fuel. These include the small amount of fuel carrier being used per acre, the volatilization of a portion of the spray, and the natural protection of overhanging vegetation which would intercept most of the herbicides. Also, birds may flush prior to the arrival of the treatment aircraft, because of its noise. At this time, an accurate estimate cannot be made as to the number of bird species or numbers of individuals which would be adversely impacted by accidental applications of diesel fuel.

According to many researchers, herbivores are likely to ingest nonlethal amounts of herbicides following such treatments when they consume food or water which has become contaminated. However, many factors make the probability of an animal in the wild receiving a toxic dose of herbicides very small. During application of these herbicides, volatilization occurs resulting in a reduced amount of these chemicals actually reaching target vegetation. Also, once a plant has absorbed any chemical, metabolic processes begin to break down the compound (Bingham 1973), therefore, an animal would not normally be able to ingest sufficient quantities of treated forage to do any harm.

Five studies (Rudd and Genelly 1956; Springer 1957; Mellandy 1967; Montgomery and Norris 1970; and Norris 1971) have shown that an animal is unlikely to ingest toxic levels of herbicides from treated forage. In 1957, Springer found that test animals were often repelled by herbicide residues on their natural foods and would not eat freshly treated vegetation, if other food sources are available. It is unlikely that all vegetation in a treated area would be contaminated by the spray, therefore, a logical assumption is that browsing animals would choose those uncontaminated plants and would not consume only plants with herbicide residue.

In his 1972 study of forested areas, Borreco found that small mammals native to western Oregon, exhibited no toxic responses to herbicides. Fears that those herbicides being proposed for use in this program would prove toxic to animals appear to be without basis, when these herbicides are used at the manufacturer's recommended rates (Brown 1967 and Norris 1971). Dosages of picloram and dicamba which would kill half of a test population of small mammals are listed in Table 3-3. As is the case in fish and birds, these chemicals are readily excreted in the urine and/or feces of mammals and there is no threat of bioaccumulation (Eaton, et al., 1974; Morre' 1974). The toxicity of these herbicides is also of low order in mammals.

Oral dosages of the proposed herbicides given to test animals did not affect the growth patterns of offspring. There were no signs of abnormal growth (teratological results) evident with oral dosages of picloram (McCollister, et al., 1969) or dicamba (Velsicol Corporation 1971).

Honeybees appear extremely sensitive to dicamba at relatively low dosages (Edson and Sanderson 1965). However, recent studies by the U. S. Department of Agriculture (Leaflet 563 Nov. 1977, revised in 1978) state that both dicamba and picloram are nonhazardous pesticides to honeybees. Information concerning other insects and their reaction to the other herbicides was not available.

Aquatic Habitat

Specific Grazing Management

At present, there is no grazing system or strategy which will maintain river ecosystems in a quality condition (McGowan 1976, Platts 1978). To insure that riparian areas receive protection where conflicts exist between grazing and wildlife, the BLM would follow procedures outlined in Chapter 1 for the protection of wetland-riparian areas. Approximately 42 miles of stream and 3,379 acres of riparian habitat would be involved in protective management.

Riparian areas important to wildlife on the Pecos River can change from year to year based on the annual, fluctuating width of the river channel which influences the location and extent of aquatic and emergent plant growth. Access for livestock to these riparian areas may also change periodically, depending on the effectiveness of saltcedar control on private and state land which would allow access to riparian habitat on public land. Based on these circumstances, methods used for protecting riparian and fisheries habitat would continually change over the long-run. As a result, the effects of grazing on this habitat would be minor and short-run as problems are recognized and protection is implemented. Over the long-run, rest periods of 16 months, 20 months, and 2 years would have favorable impacts on all groups of animals. Expected improvements in the condition of range habitats adjacent to the river would favorably influence habitat conditions within the river ecosystem by providing buffer zones and forage areas for mobile animals such as deer and antelope and contributing food sources (insects) for fish and bats.

Eighty-two acres of upland aquatic habitat associated with dirt tanks would not benefit from any of the proposed grazing systems since livestock would continue to congregate in these areas as they return to rested pastures. Even two years' rest would not be enough to permit aquatic or emergent plants to reach densities which would be useful to waterfowl, blackbirds, or sparrows. However, raccoons, long-tailed weasels, bobcats, and other wide-ranging mammals which use dirt tanks would receive short-term benefits during periods of nonuse because their prey species (amphibians, reptiles, and rodents) would breed at these sites and produce more young. However, these benefits would generally be offset by the continued lack of approach and escape cover in those areas, caused by the concentration of livestock during grazing periods. These livestock concentrations would result in a long-run detrimental impact on 82 acres of aquatic habitat.

No Specific Grazing Management

"No specific grazing" allotments furnish 76,822 acres of habitat. However, only 1.5 miles of stream along the Pecos River and one dirt tank are available for aquatic wildlife on public land. This 1.5 miles of stream would receive protection as outlined in Chapter 1. The single dirt tank would still be accessible to livestock and habitat for aquatic animals would remain poor.

Livestock Exclusion Areas

Thirty-two dirt tanks (16 acres) and seven playas (35 acres) with protective exclosures would benefit all groups of animals because of the opportunity for emergent and aquatic vegetation to become established. Sedges, cattails, and rushes would provide breeding sites for amphibians, reptiles, birds, insects, and snails. Long-run benefits for mammals would develop with an improvement in approach, escape, and foraging cover found at permanent water sources.

Terrestrial Habitat

Specific Grazing Management and Brush Control

All classes of animals from reptiles to insects would respond both positively and negatively to expected increases in ground cover from the implementation of grazing systems and brush control projects.

A reduction in the brush cover, resulting in an increased ground cover of grasses and forbs would improve range condition on scattered pastures and would benefit snakes as a group (BLM observation), grassland birds (Brown, 1978), most small mammals (Olendorff and Stoddardt, 1973), carnivores (BLM observation), antelope (Yoakum, 1975), and insects (Morris, 1967). In the initial treatment area, improved ground cover would be achieved on 25,060 acres of shinnery oak habitat, 23,540 acres of shortgrass and midgrass habitat (presently covered with mesquite), and on 5,680 acres of mixed desert shrub habitat. On the remaining 907,085 acres scheduled for treatment, the expected increase in ground cover due to reductions in mesquite would improve 158,500 acres of shinnery oak habitat, 239,500 acres of mesquite-invaded shortgrass habitat, 200,000 acres of sandy, short, and midgrass habitat, 162,785 acres of deepsand dropseed/bluestem habitat, 56,920 acres of mixed desert shrub habitat, and 79,400 acres of creosote-invaded grassland.

Less mobile animals such as long-nosed snakes and plains pocket mice, as well as ground-nesting birds like meadowlarks and Cassin's sparrows would respond to increased grass densities and seed crops throughout both treatment areas. Jackrabbits, cottontails, and kangaroo rats would decrease in all habitats where range condition improves (Norris 1950, Hoffman 1974) as mesquite is killed by herbicides and grazing is deferred on ranges for 16 months and as rest periods of 16 months, 20 months, or 2 years are implemented. The highest numbers of jackrabbits and cottontails are found in mesquite-infested shortgrass habitats (Norris, 1950). A drop in their numbers after reductions in mesquite and creosote cover would be followed by a decrease in the number of coyotes (USDI, 1973) ranging in the larger remaining treatment area (907,084 acres). Densities would decline to less than one coyote per square mile. In the initial treatment area, however, scattered pastures are too small to affect the large foraging territories of coyotes.

Badgers and their favored prey, ground squirrels, are expected to increase as range conditions improve in all reclaimed grassland areas (Olendorf and Stoddart, 1973). Specific grazing management and brush control programs would have a favorable long-term impact on both badgers and ground squirrels and on the 1,404,000 acres of their habitat.

Antelope need broad, open areas where there are no bushes or trees higher than 24 inches (Yoakum, 1975). Control of mesquite and creosote in the initial treatment area would improve 40,360 acres of poor habitat by killing 40 to 60 percent of the mesquite in these areas. Ten separate herds of antelope, totaling 143 animals, would benefit from brush control programs. Within treated pastures, approximately 2,480 acres of four-wing saltbush (a favored food of antelope) would be unaffected by herbicides (Jacoby, 1979). Control of brush on 834,000 acres of antelope habitat in the remaining treatment area would improve 77 percent of the occupied antelope range from its poor condition at present to a level which would be highly suitable for antelope, if other needs (forage, water, free movement) were met. At this time, the size of population increases to be expected in either treatment area cannot be calculated since there are other factors such as energy production (roads and surface developments) and poaching which limit herd expansion.

Removal of brush would also have adverse impacts for several groups of animals such as lizards, snakes, birds, and mule deer. BLM inventories show that the mesquite habitat has the largest number of lizard species (15) due to the interspersion of brushy, grassy, weedy, and bare areas. As brush is controlled and grazing systems are implemented, increased grass cover throughout this habitat would cause a drop in the total number of lizard species as fewer "micro-habitats" e.g., weed/ grass, grass/brush, weed/rock, were left available for them. Lizards would be adversely affected on 23,540 acres during the initial spray treatment and on 439,500 acres when remaining brush-invaded areas are sprayed.

Brush control programs, combined with specific grazing management, would reduce habitat values for certain birds and mammals on 54,280 acres during the initial treatment and on an additional 907,084 acres when those areas remaining are sprayed. The loss of mesquite would adversely affect 22 species of birds which rely on these trees for nesting, roosting, or foraging cover. Nesting birds would be harmed most by brush control programs. Roadrunners, western kingbirds, loggerhead shrikes, and blue grosbeaks could be reduced as nesters because of severe reductions in mesquite cover following retreatment. Impacts on these species would be detrimental and long-run. Loss of mesquite would also have a detrimental impact on migratory birds since migrants account for as much as 62 percent of the species utilizing this ES area's mesquite grasslands (Davis, et al., 1974). Moderate reductions in brush cover would not harm scaled quail or mourning dove habitat since an adequate number of woody plants would remain available as loafing and roost sites. The release of grasses following brush control would improve habitat for these birds on 23,540 acres in the initial treatment and on 240,000 acres in the remaining treatment area. In areas where the average kill ratio on mesquite with retreatment is greater than 80 percent combined with increased grass cover; travel lanes for doves and quail would be reduced, restricting coveys to areas where there is heavy livestock use such as watering sites, corrals, and salt licks (Renwald, et al., 1978).

Approximately 39,210 acres of mule deer habitat would be affected by reductions in brush on the area to be initially treated. The 111 mule deer using these scattered pastures primarily feed on the shinnery oak and mixed desert shrub areas. On 28,720 acres of shinnery oak, an overstory of mesquite would be sprayed. During the year of this treatment there would be some defoliation of shinnery oak, in addition to lost acorn production. Acacia and fourwing saltbush would not be affected by the proposed herbicides (Jacoby, 1979) and would continue to offer cover and forage to animals. No changes in population would be expected as a result of the initial treatment. A similar situation would exist on the remaining treatment area where mule deer occupy 733,000 acres. Their habitat is comprised of 488,000 acres of shinnery oak, 50,000 acres of mixed desert shrub, and 195,000 acres of mesquite. Most mule deer are restricted to shinnery oak and mixed desert shrub areas where herbicide sprays would have minimal effects. The effects of programs to control brush would not change mule deer populations.

Implementation of grazing systems, following programs to control brush, would affect big game habitat throughout the ES area. Reductions in the stocking rates of livestock would generally reduce competition between cattle and mule deer on the ES area's semidesert ranges (Short, 1977). This is especially true on allotments with mixed desert shrub habitats containing fourwing saltbush, a favorite forage of both cattle and mule deer. Adjustment of livestock numbers would have a beneficial impact on 772,200 acres of mule deer habitat.

On semidesert grassland ranges, mule deer consume whatever forage is most available (Short, 1977). However, since deer do not eat significant amounts of grass, cattle can be considered as competing with mule deer rather than the reverse because cattle will eat the foliage and fruits of browse plants in addition to grass (Reynolds and Martin, 1968). A 40 percent utilization level on plants key to mule deer diets, such as fourwing saltbush, combined with approximately 1,900 AUMs of forage allocated from the public lands for mule deer would result in an adjustment of livestock numbers to reduce competition and would have a beneficial impact on mule deer. However, a major increase in these populations is not expected since mule deer diets on semidesert ranges are low in phosphorus which affects reproduction, growth, and maintenance (Church 1971, Short 1977). Additionally, many deer are restricted to habitats with rough topography and low productivity soils which have poor potential for increases in forage production. In shinnery oak areas supporting mule deer herds, deer are able to utilize green herbaceous plants in the spring before cattle are brought into pastures and, although both animals browse shinnery oak plants in summer and winter, this cover is so extensive that competition would be minimal. Overall, a mule deer population increase of less than 200 animals is expected.

Antelope are primarily forb-eaters (Russell 1964, Yoakum 1976) and in the early spring, they have to compete with cattle for forbs before the grass becomes palatable. Approximately 46,790 of the 54,280 acres proposed for the initial treatment are within occupied antelope habitat. For this reason, at least one pasture out of four on every allotment must be rested annually to provide adequate forb supplies. The 16-month rest treatment would be the minimum which would satisfy this habitat need. Under a 16-month rest cycle, 13,570 acres would be rested each year. If rest treatments of 20 months or 2 years are implemented, at least one half of occupied antelope range (23,395 acres) would be rested annually both spring and summer. These last two grazing cycles would benefit antelope more than would a minimum of 16 months. The remaining 16,140 acres in three pastures would be rested at least 16 months out of every four years as provided by the proposed action since these areas contain stands of fourwing saltbush. Forage allocations for 143 antelope (119 AUMs) would reduce grazing pressure from livestock to assure proper forage utilization.

On the remaining treatment and shortgrass areas, forage allocations for antelope (approximately 1,000 AUMs) combined with yearly spring rest on at least 25 percent on 1,053,000 acres of occupied antelope habitat (approximately 263,300 acres subject to rest annually) would benefit antelope by reducing competition with cattle for early spring forbs and by bringing the range to its carrying capacity.

In existing shortgrass habitat where brush control is not needed (102,400 acres), an adjustment of livestock numbers plus moderate forage use and extensive rest (16 months to 2 years) would benefit seed-eating birds like horned larks, lark sparrows, dickcissels, and several species of raptors such as rough-legged hawks and prairie falcons.

In occupied lesser prairie chicken range, proper use of bluestem grasses would not exceed 25 percent. This would affect 26 allotments and 176,000 acres of shinnery oak/bluestem habitat. This 25 percent utilization would be met, regardless of the grazing system. Rest periods and cattle movements would be adjusted, particularly in summer months, to meet this requirement.

Carnivore populations in shortgrass areas would remain stable or increase slightly. In the case of coyotes, densities would remain at least one per square mile since their major prey items, e.g.: jackrabbits and cottontails, would not decline in shortgrass areas, since moderate forage utilization maintains existing populations (Flinders and Hansen, 1976).

The five different rest periods proposed in Chapter 1 would also affect insect populations. Under a two-year rest cycle, insects would be at their greatest numbers (Morris, 1967). According to Morris, lightly grazed plots (20-month and 2-year rests) supported greater numbers of arthropods than did moderately (16-month) or heavily grazed plots (4-month rest).

The periodic resting of pastures would have detrimental as well as beneficial impacts on terrestrial wildlife. Nesting birds would suffer some losses under all grazing treatments being considered. Rest from July through October would annually expose ground nests to trampling by livestock on approximately 39,000 acres of tobosa and sacaton grassland. If rest periods were scheduled from March through November, nesting birds would be safe from the dangers of having their nests trampled on only 25 percent of the area (58,000 acres). If all 1,404,000 acres proposed for specific management systems were to be treated using a 16-month rest regime, only 25 percent (351,000 acres) of the ES area's wildlife habitat would be rested through only one nesting period. A 20-month and two-year rest treatment would rest 50 percent of this wildlife habitat annually (702,000 acres) through two nesting seasons.

In summary, resting a pasture one year out of four or even two years out of four would continue to subject large areas to the danger of nests being trampled (Buttery and Shields, 1976). In addition, possible negative impacts could result since a 20 - 40 percent utilization of grasses during a dry year could remove a part of the grasses needed for cover by nesting birds in all habitats for the following year (Brown, 1978).

Improvements in range condition as a result of light to moderate grazing can be detrimental to some insects (Boyd, 1970) and brush control can eliminate certain species associated with mesquite, e.g.: walking sticks. Data is not available to predict quantitative changes in insect species or numbers.

No Specific Grazing Management

The 76,822 acres of public lands in allotments without specific grazing systems would maintain diversity in the ES area's range condition. All areas are invaded to some degree with mesquite, creosote, and mixed desert shrub which furnish habitat for 15 species of reptiles, 22 species of nesting birds, and 18 species of mammals. Since programs to control brush are not planned for the "no specific management" areas, gradual range deterioration is expected, even with good grazing management (See Vegetation for long-run plant changes).

One antelope herd would be affected by this brush infestation. Fifteen antelope using the lightly mesquite-infested areas of allotment 6048 (5,800 acres) would be pushed out by an increasing invasion of brush. Other "no specific management" allotments constitute only part of other ranges for antelope herds and would not significantly affect distribution of this animal.

Maintenance of 76,800 acres of brush-invaded range would be a continuing beneficial impact to brush-adapted species.

Livestock Exclusion Areas

Approximately 6,565 acres of livestock exclusion areas are planned and would benefit all groups of animals. No single species would depend solely on an exclusion area for its existence, however, some exclusion areas would provide important seasonal habitat for many species. The effect of livestock exclusion on snakes would be a long-run locally beneficial impact. Coachwhips and western rattlesnakes would benefit from improved foraging areas and escape cover found in protected cottonwood, hackberry, and soapberry groves. Improved grass cover and composition in shinnery oak areas should increase the numbers of rodent species available as prey for snakes. Lizards would be affected only in mixed desert shrub areas and in the shinnery oak exclusion areas. The usually poor soils of mixed desert shrub areas are not expected to support dense stands of grass even with protection, therefore, forage areas for lizards should not be seriously affected. As a result, exclusion of livestock from mixed desert shrub habitat would be a locally minor, negative impact. In the shinnery oak areas, increased grass cover would lessen the number of open foraging areas for lizards but detrimental effects on species occurrence and total numbers cannot be quantified with available data.

Protection of 17 individual groups of trees through fencing, together with protection of these trees and of those used by nesting birds of prey (75) from brush control programs, as outlined in Chapter 1, would preserve broadleaf tree habitats on public land. This would have a favorable long-run impact on many birds and mammals using these areas (see Appendix 1, Table A-6). The exclusion of livestock from 40 acres of Brushy Draw's 450 acres of desert trees on allotment 7039 would minimize disturbance by livestock near water sources. Groves and small groups of trees are valuable nesting, roosting, and foraging habitat for many birds and provide bedding sites for mule deer. Additionally, wooded habitats offer birds protection from those environmental and climatological extremes which are common to desert grasslands (Wiens, 1974).

Antelope would benefit from forb production at seven protected playas (35) acres.

Twenty-one allotments would have exclosures set aside to provide nesting habitat for lesser prairie chicken. While none of these exclosures would exceed 160 acres, they would have a long-term beneficial impact on this species and other ground-nesting birds. Livestock exclusion areas are necessary to ensure that prairie chickens have adequate nesting cover available on a yearly basis (Brown 1978, New Mexico State University 1977).

Exclusion areas would provide carnivores with foraging areas containing different species and numbers of prey. Increased vegetation (height, cover, and density) would provide resting and escape cover for both predators and prey until brush invasion reduced grass cover (See Vegetation). Exclusion areas would, therefore, have a short-run beneficial impact. Exclusion of livestock from the Mescalero Sands South Dune Area A (1,885 acres) would help to maintain a remnant herd of approximately ten white-tailed deer by reducing competition for forage and by preserving the unique shinnery, cottonwood, and willow habitat complexes. Exclusion would have a beneficial impact to white-tailed deer.

Facilities

The use of 203 miles of proposed fences as perches in existing and reclaimed shortgrass habitats would benefit raptors, meadow larks, lark buntings, and roosting nighthawks.

The proposed construction of 246 livestock watering troughs would have a minor beneficial impact on horned larks and chestnut-collared longspurs because trampled areas around drinking troughs are favorite foraging areas for these birds (BLM observation).

The construction of 203 miles of fence would pose a hazard to mule deer since jumping animals occasionally get caught in the top wires (Wagner, 1976). Any fence poses a difficulty to antelope but, since these fences would meet BLM standards, movement problems for antelope would be minimal.

The addition of 211 watering sites in occupied antelope range and 180 sites in occupied mule deer range would aid in the stability of herds and promote continued habitat occupancy. Water developments would have a beneficial impact on antelope and mule deer.

Burning

Burning of grassy draws would open up these areas to lizards in adjacent habitats for only a short period until grass cover approached preburn levels. Snakes occupying these areas are not expected to be seriously harmed, especially nocturnal or burrowing types such as Texas blind snakes, since heat from fires rarely causes temperatures to increase more than a few inches below the surface (Heyward 1938, Ito and Iizumi 1960). Burning of grassy draws would have a minor favorable, local impact on reptiles.

Approximately 520 acres of alkali sacaton draws and tobosa grass swales would be control-burned in shortgrass habitats. Based on studies in southeast Arizona (Bock and Bock, 1978), spring burns in sacaton areas would result in greater bird use of areas which have been burned in preference to those which have not. Specifically, raptor use is greater on first and second year burns because rodents seeking tender regrowth are easily captured. Summer use of burned areas was also greater by the seed-eating birds.

Similar responses would be expected in tobosa grasslands. A study by Renwald (1977) showed that nesting lark sparrows preferred tobosa grasslands which had been burned. However, this preference would last only about five years, or until grass cover reached preburn levels. In the ES area, burning is scheduled before the onset of the nesting season and overall, burning would represent a localized short-term beneficial impact to birds.

Summary and Conclusion

The proposal to treat mesquite and creosote with herbicides would have little direct effect on wildlife. However, 264,000 acres of shortgrass habitat, 200,000 acres of short and midgrass habitat and 160,000 acres of dropseed/bluestem habitat in deep sand areas would improve for grassland birds, most small mammals, kit fox, badger and antelope as mesquite and cresote densities are reduced. This same change would have detrimental effects on the brush land habitats that support toads, lizards, shrubland birds, jackrabbits, bobcats, coyotes, and mule deer.

Aquatic habitat conditions along all 42 miles of the Pecos River public lands would improve through improved range condition and riparian protection policies.

Specific grazing management would produce varied habitat responses. Most impacts would be beneficial since forage allocations to big game, adjustments in livestock numbers, and moderate utilization of vegetative resources would improve range condition. Improved range conditions and grazing at moderate levels would be favorable to insects, rodents, birds, and antelope. Acreages which would benefit from grazing rest, range from 326,700 acres which would be rested annually under 16-month treatments to 653,500 acres rested annually under 20-month and 2-year rest cycles. Larger rested areas would be more favorable to ground-nesting birds to reduce disturbance of nests. Antelope would have at least one pasture out of four on every ranch rested to furnish undisturbed forb supplies. Rest periods would be adjusted to insure that bluestem grass utilization does not exceed 25 percent on 176,000 acres of lesser prairie chicken habitat.

"No specific grazing" management on 76,800 acres would benefit brush-adapted wildlife since brush would not be controlled on these areas and brush infestation would be imminent (Wiens and Dyer, 1975). A herd of fifteen antelope would eventually be displaced in this area as brush advances.

Exclusion of livestock from 17 broadleaf tree groves would benefit birds of prey, resident and migrant songbirds, local foraging carnivores, and provide bedding sites for mule deer. Exclosures at 32 dirt tanks would not establish the upland aquatic habitat potential in the ES area. All 164 dirt tanks would remain unprotected and extensive rest periods would not establish emergent plants at these sites. Seven playas would be fenced allowing for emergent plant establishment on 35 acres of seasonally wet habitat. This would benefit waterfowl, local songbirds, migrating shorebirds, and resident antelope. Twenty-five 160-acre exclosures would be established to allow development of nesting cover for lesser prairie chickens, and exclusion of livestock from 1,885 acres of the Mescalero Sands South Dune Area A would preserve the cottonwood/willow habitat used by whitetail deer and protect the active duneland occupied by the sandune sagebrush lizard.

Fences would provide perches for a variety of birds but pose a hazard to deer and antelope. Building fences to BLM standards would minimize dangers to big game. The addition of 211 waters in occupied antelope range and 180 waters in mule deer habitat would promote continued habitat occupancy.

The burning of 520 acres of sacaton and tobosa bottomland would benefit grassland birds, rodents, and birds of prey.

In conclusion, the proposed brush control program would reduce habitat quality on 30 percent of shrubland habitats, however specific grazing management would improve habitat conditions on all areas. Only big game and predator populations are known and their numbers would not change significantly.

ENDANGERED WILDLIFE SPECIES

(Acronyms used in this section are: FE = Federally Endangered; SEI = State Endangered Group I; SEII = State Endangered Group II; BL = The Audubon Society's Bluelist).

Aquatic Habitat

Specific Grazing Management, Brush Control, and Exclusion Areas

The eight species of fish considered as endangered by the New Mexico Department of Game and Fish (NMDG&F) would respond favorably to protection of wadeable pools and riffles where breeding occurs as a result of riparian preservation of 42 miles of stream. The blue sucker (SEI), Mexican tetra (SEII), gray redhorse (SEI), bigscale logperch (SEII), silverband shiner (SEI) and green throat darter (SEII) would benefit from livestock being excluded, preventing disturbance of breeding pools and riffles and improvement of adjacent watersheds through grazing systems and brush control.

Protection of the riparian habitat would also benefit amphibians, reptiles, and birds inhabiting the Pecos River area. Amphibians and reptiles affected are: Blanchard's cricket frog (SEII), Eastern barking frog (SEII), Pecos western ribbon snake (SEII), blotched plainbellied water snake (SEII), and Texas slider turtle (SEII). Birds which are dependent on the riparian areas are: yellow-crowned night heron (BL), little blue heron (SEI), canvasback (BL), southern bald eagle (FE & SEI), Marsh hawk (BL), Osprey (BL), Mississippi kite (SEII), least tern (SEII & BL), black tern (BL), yellow-billed cuckoo (BL), and yellow-breasted chat (BL). Additionally, aquatic birds would find cover and food at 32 partially fenced dirt tanks (16 acres) and seven playas (35 acres). However, 164 dirt tanks (82 acres) would remain unprotected from livestock trampling which would continue to leave upland aquatic habitat in poor condition throughout the ES area.

Terrestrial Habitat

Specific Grazing Management and Brush Control

The Trans-Pecos rat snake (SEII) would benefit from improved plant density and ground cover in 32,000 acres of mixed desert shrub habitat within its range under 16-month to 2-year rest period grazing cycles. July through October and March through November rests would maintain mixed desert shrub habitats in their present condition with sparse patches of black grama receiving occasional use by cattle.

Grassland birds depend on abundant seed crops to support both summer residents (Raitt and Pimm, 1974) and winter populations (Fretwell 1972 and Weins 1974). Under 20-month and 2-year rest, 50 percent of existing and shortgrass habitats which have been treated to control brush (183,000 acres) would be rested annually, providing ample seed crops on half of the shortgrass areas every year. This would benefit McCown's longspurs (SEII), and vesper sparrows (BL). Under other grazing treatments, 40 to 60 percent utilization of large seeded grasses would leave large quantities of seeds for birds. The 40 to 60 percent use level would harm nesting birds during dry years, since any forage removed through grazing would not be available as cover for the following years' nesters. A study by Brown (1978) indicated that a 20 percent utilization of forage during dry years would be harmful to nesting longbilled curlews.

Ferruginous hawks (BL), Swainson's hawk (BL), prairie falcons (BL), kestrels (BL), burrowing owls (BL), and short-eared owls (BL) would benefit from increases in rodent populations (mice and ground squirrels) as a result of the increased availability of seed crops (Olendorf and Stoddart, 1974).

Periods of nonuse would not interfere with nesting plovers (BL), in existing and reclaimed shortgrass habitats, however, this benefit could be offset by cattle use of other pastures where nesting could be disrupted (Buttery and Shields, 1976). Disturbance of nests would affect nesting habitat for the above species annually on 533,000 acres (50 percent of nesting habitat) during 20-month and 2-year rest cycles, 800,000 acres (75 percent of nesting habitat) during 16-month rest cycles, and on 58,000 acres periodically with March through November rest.

Sharp-shinned hawks (BL), Cooper's hawks (BL), Swainson's hawks (BL), and Harris' hawks (BL) would be adversely impacted with high mesquite mortalities on 868,500 acres of hunting habitat. Twelve Swainson's hawk nests and three Harris' hawk nests would be protected by the 300-yard buffer zones required by the proposal during brush control operations.

No Specific Grazing Management

Maintaining 76,800 acres of brush in allotments which are proposed "No Specific Grazing Management" would benefit brush-adapted endangered wildlife such as the Trans-Pecos rat snake (SEII) sharp-shinned hawk (BL), Cooper's hawk (BL), Swainson's hawk (BL), Harris' hawk (BL), marsh hawk (BL), American Kestrel (BL), and merlins (BL).

Since tracts proposed for "no specific grazing management" are widely scattered, no significant detrimental impacts for endangered species would be expected.

Livestock Exclusion Areas

Widely scattered groves of trees (17) within the ES area that would receive protection would result in long-term beneficial impacts to classified species such as Mississippi kites (SE II), sharp-shinned hawks (BL), Cooper's hawks (BL), Swainson's hawks (BL), Bell's vireos (SE II, BL), and yellow-breasted chats (BL). Protection of 6,545 acres of shinnery oak habitat would benefit Baird's sparrows (SE II) in the short-run with initial increases in grass production.

Facilities

The use of 203 miles of proposed fences as perches would have minor but beneficial impacts to classified raptors and perching birds.

The construction of 246 watering sites would have beneficial impacts on McCown's longspurs (SEII) since trampled areas around watering sites are favorite foraging areas for these birds (BLM observation).

Burning

The effects of burning on habitats used by classified species is the same as that found in this section for common birds.

Summary and Conclusion

Endangered species would not be adversely impacted.

OTHER CLASSIFIED WILDLIFE

Peregrine Falcon: Overall range improvement as a result of the proposed action would benefit the few migrant peregrine falcons (FE, SEI) using the ES area's public land. Due to the small numbers of birds present, impacts would be minor.

Black-footed Ferret: Although habitat is available, black-footed ferrets (FE, SEI) have not been seen in recent years (Hubbard, 1978). Impacts on this carnivore would be negligible, if any are present.

HUMAN HEALTH

The chance of people being exposed to levels of these herbicides which would be injurious to their health depends on two factors. One is the actual toxicity of the chemical (its toxicological potential). The second is the risk of exposure to levels approaching hazardous dosages. Human exposure to a herbicide depends on the pattern of use, frequency of application, amounts used, and length of herbicide life in the environment. Such exposure may occur from handling before dilution, from inhalation during spraying operations, or from dust during application. These chemicals could also be ingested with food or water. Because the highest risks are from concentrates and because these chemical concentrates are handled at all stages from manufacture until dilution for application, people involved with these herbicides would experience a greater risk than would any other organism.

There is no known record of people ingesting toxic levels of these herbicides but that toxic level can be projected from data compiled for other mammals. Selected information concerning herbicide toxicity was compiled by Heikes (1967) and is summarized in Table 3-4 which indicates that, at the toxicity level for the proposed chemicals, a toxic dose would range from one ounce to one quart (averaging one pint).

This research (Heikes 1967) shows that the chemicals proposed for use are relatively nontoxic for humans. Therefore, it is expected that human exposure as a result of herbicides which would be applied in the manner described in Table 1-7 would not injure human beings. The

TABLE 3-4
RELATIVE TOXICITY OF HERBICIDES TO HUMANS
(Source: Heikes 1967)

Common Name or Designation	Some Common Trade Names	LD_{50}[1] mg/Kg	Toxicity Rating
2,4,5-T (2,4,5-TP)	Various (Silvex)	300	3
2,4-D	Various	500	4
Aspirin*		750	4
Dicamba	Banvel-D	1,040	4
Atrazine	Atrazine	3,080	4
Table Salt*		3,320	4
Picloram	Tordon	8,200	5

Toxicity Rating	Class	LD_{50} mg/Kg	Probable Lethal Dose for 150 lb. man
1	Extremely toxic	Less than 5	A taste (less than 7 drops)
2	Very toxic	5-49	7 drops - 1 teaspoonful
3	Moderately toxic	50-49	1 teaspoonful - 1 ounce
4	Slightly toxic	500-4,000	1 ounce - 1 point (1 lb.)
5	Nontoxic	5,000-14,999	1 pint - 1 quart
6	Nontoxic	15,000 & above	More than 1 quart

[1] LD_{50} is the rate at which test animals were fed in relation to body weight (mg/kg) and half or 50 percent of the test animals died (Lethal dose, 50 percent).

*Included for a comparison with chemicals in everyday use.

minimal hazard that does exist would diminish with time, after completion of brush control treatments.

Laboratory tests have been conducted on various animals such as mice and rats to evaluate the potential of picloram and dicamba for causing abnormalities in their offspring (teratogenic damage) or of the possibilities of causing cancers (carcinogenic damage) or mutations (mutagenic damage). These tests involved feeding these animals low-levels of herbicides over extended periods of time. The following results have been indicated from available publications:

Herbicide	Teratogen	Carcinogen	Mutagen
Picloram	No[1]	No[3]	No[4]
Dicamba	No[2]	Data Unavailable	No[4]

References:
1. McColister, et al., 1969
2. Velsicol Corporation, 1971
3. National Cancer Institute, 1978
4. Bignami, et al., 1977

The danger of these herbicides accumulating in human tissue (bioaccumulation) is small since picloram and dicamba are readily excreted by all other major groups of animals, including mammals. The long-term cumulative impacts of herbicides showed little or no effect on test animals.

Chronic exposure to picloram showed little or no ill effects on test animals after feeding studies for 90 days, with dietary levels as high as 1,000 ppm (McCollister, et al., 1969). In long-term feedings, albino rats and beagle dogs were fed picloram at a rate of 15 to 150 miligrams per kilogram of body weight for two years. There were no adverse effects observable in either species as measured by body weight, food consumption, behavior, mortality, hematological and clinical blood studies, or urine analyses.

Dicamba was fed for 13 weeks to male and female rats at the rate of 100, 500, 800, and 1,000 ppm of the diet. Food consumption and growth remained normal, no deaths occurred, and pathology at the end of seven weeks was negative. At the end of 13 weeks there was some liver and kidney damage at the 800 and 1,000 ppm level, but none at or below the 500 ppm level. Rats fed at 5, 50, 100, 250, and 500 ppm of diet, and dogs fed at 5, 25, and 50 ppm of diet, showed no apparent effects after two years of continuous feeding (Velsicol Corp. 1971).

Summary and Conclusion

When used at application rates as recommended by manufacturers, dicamba and picloram pose no threat to humans.

CULTURAL RESOURCES

Chemical Brush Control

Herbicide which is not dissipated or removed by surface run-off may enter the soil profile. The depth to which the herbicides enter the profile is dependent on factors such as soil texture, soluability of the herbicide, and the relative affinity of herbicides to the soil complex (Scifres 1975).

Very little of the diesel fuel used as a carrier for the herbicide would be expected to reach the soil surface. Once on the surface, that portion of the diesel fuel which has not evaporated would enter the soil profile (see the Soils section). Because diesel fuel has a low water-soluability level, it is not expected to penetrate the soil profile to any great depth.

Radiocarbon samples taken from sites both within and adjacent to the ES area were taken at depths ranging from 2.5 inches to 10 inches below the surface (Beckett, Strong, and Strong, 1976; Runyan 1971).

Given the tendency of herbicides to penetrate the soil profile and the relatively shallow depth of the cultural material, there is a strong possibility that the herbicides would contaminate material which would be useful in radiocarbon dating. The herbicides could add fresh carbon to the material and could result in an inaccurate dating of that material.

Sites located in sandy soils would be highly susceptible to this contamination since they are usually at or very near the surface and since herbicides penetrate further in sandy soil. The diesel fuel used as a base for the herbicides would be more likely to penetrate the sandy soil far enough to contaminate the material.

Sites located on a floodplain would be less susceptible to this type of contamination since they would generally be covered with alluvium. Herbicides do not penetrate as far in alluvial soils.

Based on existing information, at least two hundred sites have the potential of being affected by the chemical spraying. At least 75 percent of these sites are located in sandy terrain. The remainder of the sites are located on various terrains which include hilltops, playa edges, floodplains and river terraces. However, very few of the affected sites are located on a floodplain.

The following sites or districts which have been determined to be eligible for the National Register would be impacted by herbicidal spraying: Maroon Cliffs Archeological District, AR 30-6-1034, and Laguna Plata Archeological District. There would be no adverse effect from herbicidal spraying on Mescalero Sands Archeological District (nominated to the National Register), Pope's Wells, HI 30-6-190, AR 30-6-30, AR 30-6-1034, AR 30-6-73, and AR 30-6-1047 (determined to be eligible for the National Register).

The burning of vegetation in areas where there are cultural resources would affect the interpretation of the function and date of the sites. Fires, whether planned or unplanned, have the potential of altering the thermoluminescence, radiocarbon, and archeomagnetic dates (Michels 1973) and also of charring previously unburned animal and vegetal material. The burning of sacaton would not have an effect on sites or districts which are eligible for the National Register.

Specific Grazing Management

Livestock grazing would continue to disturb cultural resources. The presence of livestock on a site has the potential of altering the interpretation of that site in several ways. The addition of fresh carbon from animal wastes could contaminate radiocarbon samples. Vertical and horizontal displacement of artifacts would result from the use of existing cattle trails and the creation of new trails through sites as well as from trampling. In addition, trampling of a site would modify the artifacts themselves by chipping and fracturing them.

Because there is very little restriction on the movement of livestock, all cultural resource sites could be impacted in the manner described above. Those cultural resource sites located near watering facilities and fencelines would be impacted more than the others.

The artifacts on the majority of the sites, especially those situated in sandy soil, are located within the top 10 inches. Therefore, the surface disturbance of these sites is an important source of impact.

The cultural resource sites or districts which are eligible for inclusion in the National Register of Historic Places, such as Laguna Plata Archeological District, Maroon Cliffs Archeological District, Pope's Wells AR 30-6-30, AR 30-6-73, AR 30-6-1034, and AR 30-6-1047 would be affected by cattle trampling. There would be no impact on the Mescalero Sands Archeological District which has been nominated for, or HI-30-6-190, which is eligible for the National Register.

No Specific Grazing Management

In areas where "specific grazing management" programs would not be implemented, erosion would continue at its present rate. The effect of water erosion on cultural resources varies. A mild case of erosion may expose a site, while a more severe case would wash the material downstream, mixing occupational levels. An extreme case of downcutting would result in the total destruction of the site.

Water erosion hampers the archeologist's ability to determine the function and date of the site by changing the vertical and horizontal placement of the artifacts and by leaching away potential radiocarbon samples from hearths. Sites exposed by erosion provide additional data for the archeologists and additional material for the artifact collectors.

Existing information is insufficient to say how many cultural resources would be affected in this manner. Based on knowledge of the area by BLM archeologists, the probability of erosion being an impact is greatest on those allotments in the northern part of the ES area. There would be no impact on cultural resource sites or districts eligible for the National Register of Historic Places.

Livestock Exclusion Areas

The exclusion of livestock has the potential of protecting cultural resources within the exclosed areas by eliminating the effects discussed under specific grazing management. Also, because access would be limited, there would be a reduction in the amount of pothunting. There would be no impact on cultural resource sites or districts eligible for the National Register of Historic Places.

Facilities

Additional physical access would be expected during the construction of range facilities and during implementation of vegetative treatments. Generally, this access would be confined to unimproved two-track trails which would be expected to remain after construction is completed.

The amount of pothunting or artifact collecting within an area tends to increase when additional or improved access is provided. Projectile points, decorated pottery, and both manos and metates are considered collectable items by pothunters. By collecting these objects, pothunters reduce the archeologist's ability to date and determine the function of the site. This effect, which is irreversible, is pronounced within the ES area since the majority of the sites are surface scatters.

While these impacts would occur wherever additional access is provided, they would be greatest in those areas which now have limited access. Twenty-three watering facilities and 17 fences have been proposed for construction in areas of limited access. These facilities are proposed for 18 allotments. The Mescalero Sands Archeological District National Register nomination is located in one of the areas of limited access in which there is proposed construction. Because this District has been fenced, there should be little additional pothunting resulting from the additional access. There would be no impact on the other cultural resource sites or districts which are eligible for the National Register.

The proposed facility construction itself could affect cultural resources. The proposed placement of facilities on 12 allotments may disturb cultural resources which have not yet been identified. In addition, the removal of vegetation necessary for construction of these facilities could result in short-run erosion which would affect the cultural resources.

Summary and Conclusion

The major direct impacts of the proposed action on cultural resources is the trampling of sites by livestock and the contamination of radiocarbon samples from herbicidal spraying. The other major source of impact is increased pothunting which is an indirect result of providing additional access to an area.

VISUAL RESOURCES

The impacts of any action on the visual resources are determined by completing a contrast rating. This rating numerically displays the differences in form, line, color, and texture between the existing environment and that which would be created by the proposed action. (See BLM Manual 8421 for further explanation of contrast ratings). The level of impact would vary depending upon the class involved.

Specific Grazing Management

Implementation of "specific grazing management" systems would impact the ES area's visual resources. Although it is not feasible to prepare a contrast rating for each allotment area which would become subject to a specific grazing management system, it can be assumed that such a system being implemented would eventually change the composition and density of vegetation within the ES area. A change in vegetative composition would result in a change of the form, line, color, and texture elements of the landscape which would increase visual variety. Contrasts would be most evident along fence lines between those pastures being grazed and those pastures being rested. There would also be a potential contrast between allotments subject to "specific grazing management" systems, any neighboring allotment under "nonspecific grazing management", or any adjacent livestock exclusion areas.

No Specific Grazing Management

In addition to possible contrasts between livestock exclusion areas and areas with "specific grazing management" systems, "no specific grazing management" areas would have a stronger contrast since vegetation being grazed yearlong would normally be shorter.

Livestock Exclusion Areas

Livestock exclusion areas would have a significant effect on visual resources. Exclusion of livestock grazing from an area would result in its vegetation approaching optimum density and maximum growth, dependent on climatic conditions. This would be in strong contrast to vegetation being alternately grazed and rested adjacent to the exclusion area. However, because exclusion areas are small and in remote locations, this would have a low impact.

Facilities and Vegetative Treatments

Livestock facilities and range treatments have the highest potential of all of the proposed action's elements for causing effects on the visual resources. Livestock facilities include fences, windmills, drinking tubs, pipelines, storage tanks, and dirt tanks, as shown on Table 3-5. With the exception of the dirt tanks, all livestock facilities exhibit blocky forms with straight vertical or horizontal lines, and smooth texture.

TABLE 3 - 5
VISUAL IMPACT SUMMARY
(Source: Roswell District Files)

	Class I	Class II			Class III			Class IV		
		Fg	Bg	SS	Fg	Bg	SS	Fg	Bg	SS
Fences	0				0	0	0	0	0	0
Pipelines	X				0	0	0	0	0	0
Windmills	X				0	0	0	0	0	0
Tanks	X				0	0	0	0	0	0
Reservoirs	X				0	0	0	0	0	0
Troughs	X				0	0	0	0	0	0
Vegetative Treatment										
Mechanical		X	X	X	X	X	0	0	0	0
Chemical	0	0	0	0	0	0	0	0	0	0

FG	- Foreground/Middleground (0-5 miles)
BG	- Background (5-15 miles)
SS	- Seldom Seen (15 + miles or hidden areas)
X	- Discordant Impact
0	- Harmonious Impact
Blank	- No Facility Proposed

A proposed livestock exclosure fence (1.0 mile) next to the west boundary line of the Mathers Research Natural Area would be within the VRM Class I area. The proposed facility would exceed management criteria for this visual resource class. However, the severity of this contrast would be reduced since it would be connected with the Mathers boundary fence which is an existing intrusion of the same type. Other internal and external visual impacts occur in this general area.

The proposed action does not include any livestock facilities within the VRM Class II areas. Approximately 2,600 acres being proposed for chemical brush control treatments are in VRM Class II areas on allotments 7036 and 7037. Chemical brush control treatments would not strongly impact the visual resources.

Five miles of fence and three water developments (Allotments 5051, 5057, 5058, and 7027) are proposed within VRM Class III areas. These types of facilities would not exceed maximum contrast ratings of approximately 15, when viewed from a major travel route. A rating of 15 is just below the standard maximum contrast rating of 16 for VRM Class III areas. In addition to the new facilities, 520 acres of sacaton would be burned in Allotment 5057 and 4,240 acres of mesquite on Allotments 5062, 5069, and 7022 would undergo chemical brush control treatments. These vegetative treatments would have highly visible but short-run, impacts on visual resources, due to smoke from areas being burned.

The remainder of proposed facilities and vegetative treatments would be planned for VRM Class IV lands. On Class IV lands, these developments would have a contrast rating which would be well below the established standard maximum for those areas. There would be negligible site-specific impacts and a long-run but low-intensity cumulative visual impact for the ES area.

Summary and Conclusion

No VRM classes would change as a result of the proposed action.

RECREATION

Hunting

Implementation of either "allotment-specific grazing management" or continuation of grazing with "no specific management" would not directly impact hunting opportunities on the ES area's public lands. Creation of livestock exclusion areas would promote concentrations of game birds and animals, making game easier to locate and increasing the chance of hunter success. Impacts of the proposed action on hunting opportunities for prairie chickens, ducks, geese, cranes, jack rabbits, or mule deer would be negligible because the proposed action would not directly affect their primary habitat (See Wildlife section for more detailed information). The development of livestock watering sites would have a slightly beneficial impact on all hunting because the water attracts game. Brush control projects would have minor beneficial and adverse impacts on hunting opportunities. At present, the Pecos River supports only a low population of fish (primarily catfish and carp) and requires supplementary stocking from fish hatcheries. In 1975, approximately 2,500 fisherman days were attributable to BLM lands located along the river. Habitat for game fish is limited because the river is subject to flooding during thunderstorms and spring snow melts and because low water levels occur throughout the remainder of the year due to irrigation requirements.

The effects of grazing on fish habitat would be minor and short-term as problems are recognized and protection is implemented. Over the long-term, the proposed actions would have a favorable impact since improvement in range habitats adjacent to the river would enhance conditions in the river ecosystem by buffering the area and contributing insect food sources.

Off-Road Vehicle Uses

The primary impact on the use of off-road vehicles (ORV) would be the construction of 203 miles of additional fence within the ES area. These fences would have a long-term, although slight, adverse impact on accessibility to ORV use areas and on free movement within these areas.

Summary and Conclusion

Hunting opportunities for birds would generally decrease and increase for antelope. However, projected hunting demands would still be met. Free movement of off-road vehicles (ORVs) would be slightly reduced due to additional fences.

WILDERNESS

Roadless Areas

The 18 roadless areas would not be adversely impacted by the "specific grazing management" proposed because grazing pressure would be reduced, enhancing the scenic attributes of the areas. Grazing is not now and would not be occurring in the Instant Wilderness Study Area, but grazing does occur on contiguous roadless areas.

Because the grazing level would be reduced under "no specific grazing management", the vegetative condition would be maintained or improved. Existing wilderness characteristics, if they exist, would be maintained.

Range improvement facilities proposed would not noticeably affect roadless areas because they would be designed in a manner which would make them substantially unnoticeable in the area. The Instant Wilderness Study Area would not be affected since no facilities are proposed within it, or the contiguous roadless areas. One exclosure (approximately 60 acres) would be built adjacent to the Instant Wilderness Study Area on the west, but it would not detract from the qualities within it. All other facilities proposed are fences which would be located over a quarter of a mile away from the Instant Wilderness Study Area.

Successful control of mesquite and creosote infestations through the use of chemicals would change the visual aspect on portions of fourteen roadless areas from brush to grass. This change would be consistent with wilderness guidelines, since these species are invaders in southeastern New Mexico (see Vegetation section). A reduction in the densities of these shrubs would return the areas to a condition resembling that which existed prior to mesquite invasion.

The closest brush control projects (six areas totaling approximately 5,700 acres) would be located approximately six miles from the Mathers Research Natural Area Instant Study Area and would not be visible from it.

Control of brush through the use of mechanical grubbing or burning is not proposed within any of the roadless areas. Therefore, impacts would not occur.

Summary and Conclusion

The proposal would have virtually no effect on possible wilderness values of the ES area.

LIVESTOCK GRAZING

Under the proposed action, livestock authorizations (numbers) would be adjusted according to the 1977-78 range survey on the 20 existing allotment management plans (AMPs), the 90 allotments proposed for inclusion under "allotment-specific grazing management" systems, and the 74 allotments with "no specific grazing management systems." These approximate adjustments are summarized on Appendix 3, Table C-3 and text Table 3-6 (Adjustments in livestock AUMs). The 20 AMP allotments would have net reductions of approximately 12,533 AUMs. Those 90 allotments proposed for specific management would have a net reduction of approximately 46,174 AUMs. The net reduction on those 74 allotments proposed for "no specific grazing management" would be 7,067 AUMs. Table A-21 (Projected AUMs on public lands with the proposed action) shows the changes of AUMs on each allotment.

Statistics concerning changes in AUMs are based on Appendix 3, Table C-3 and Table 3-6. The total number of AUMs available for use are shown in column F, Table C-3. Overall, there would be 30 allotments which would receive increases and 154 which would experience reductions.

TABLE 3-6
ADJUSTMENTS IN LIVESTOCK AUMs FROM AVERAGE LICENSED USE
(Source: Roswell District Files)

EXISTING SPECIFIC GRAZING SYSTEMS ALLOTMENTS	
2,528 AUMs Increase on 2 Allotments	(42,998 Acres)
15,061 AUMs Decrease on 18 Allotments	(539,958 Acres)
PROPOSED SPECIFIC GRAZING SYSTEM ALLOTMENTS	
5,753 AUMs Increase on 22 Allotments	(162,105 Acres)
51,927 AUMs Decrease on 68 Allotments	(768,251 Acres)
NO SPECIFIC GRAZING SYSTEM PROPOSED ALLOTMENTS	
196 AUMs Increase on 6 Allotments	(2,300 Acres)
7,263 AUMs Decrease on 68 Allotments	(74,522 Acres)
NET CHANGES	
74,251 AUMs Reduction	
8,477 AUMs Increase	
65,774 AUMs Proposed Reduction of AUMs from Average Licensed Use	

Chemical Brush Control

Dicamba and picloram are the two herbicides that are proposed for use in the ES area's spraying program. Both dissipate rapidly within the first 30 days after treatment. Dicamba and picloram are safe for dairy cattle to graze 60 days after treatment, beef cattle need not be withdrawn at all (Velsicol 1972). After 170 to 210 days, all detectable residue of picloram is dissipated (Hoffman 1972). The 16-month deferment of each pasture for vegetative establishment as stated in the proposed action would allow more than enough time for herbicides to fully dissipate. If beef cattle were to graze a treated pasture by accident, there would be no ill effects. Livestock would not be adversely affected by those herbicide treatments being considered for use in the proposed action nor by any potential accidental exposure to those herbicides.

Specific Grazing Management

The initial livestock adjustment would decrease livestock production. However, as a result of vegetative treatments, grazing systems, and the adjustment of livestock numbers, livestock forage production would increase by the year 2000 (See Appendix 3, Table C-3, Projected AUMs on public lands with the proposed action).

When livestock are transferred to a new pasture under the initial cycle of a specific grazing management system, a weight loss could occur, until they become acquainted with water locations and preferred grazing areas within the pasture. Once cattle become accustomed to the new grazing system, any weight lost should be regained.

Breeding programs, both seasonal and yearlong, would benefit from implementation of "specific grazing management" systems. The increased grouping of cows would result in better bull coverage and an increased calf crop. However, ranchers could be expected to experience a greater workload because of maintenance requirements for present and proposed improvements as the new grazing systems are implemented.

There are several impacts which could be expected to occur with the initial cycle of a new grazing system. During the initial cycle of some grazing systems, poisonous plants such as goldenrod would pose a problem for livestock grazing. This impact would be short-run until vegetative conditions improve as a result of vegetative treatments and grazing systems. Grazing systems which call for less than one year's rest, usually would not require a decrease in livestock numbers because all available livestock forage would be accessible during various parts of the year. However, on the public lands, grazing systems requiring more than one year's rest would also require an additional 25 percent reduction in livestock numbers during the cycle's first year because forage in pastures being rested would not be available for grazing. This reduction would not extend beyond the first year.

No Specific Grazing Management

Livestock authorizations (numbers) on allotments with "no specific grazing management" proposed would be adjusted, according to the 1977-78 range survey and there would be little additional change in livestock AUMs by the year 2000 (See Appendix 3, Table C-3, Projected AUMs on the public lands with the proposed action). There would be little change in the present livestock operation, livestock breeding practices, livestock facilities, or poisonous plant problems.

Facilities

There are three methods of vegetative treatments (chemical, mechanical, and burning) proposed for allotments with AMPs and proposed specific grazing management systems. Chemical and mechanical treatments would be undertaken during the rest cycle of a pasture. Normally, treated pastures would be rested for two consecutive growing seasons (a minimum of 16 months). Livestock forage would be unavailable from these pastures during periods of extended rest, thus livestock numbers would be adjusted to the capacity of remaining pastures. By the year 2000, there would be an increase of livestock forage on these pastures as shown in Appendix 3, Table C-3 (Projected AUMs on the public lands with implementation of the proposed action). Burning would be used on grassland areas having large quantities of unpalatable forage residue (tobosa and alkali sacaton). Burning would be planned for the period from January 1 until March 30 (see BLM planning system). After burning, regrowth would begin and large amounts of palatable livestock forage would be expected to become available during the following spring and summer. Burning would need to be repeated every four to five years to keep unpalatable growth from accumulating.

Installation of the proposed facilities (fences and watering sites) would better distribute livestock over the allotment. This would help to achieve a better utilization of the total allotment.

Summary and Conclusion

There would be three major impacts of the proposed action on livestock within the ES area. First, there would be a reduction of 65,774 AUMs from the present active use to balance with the present production of forage allocated to livestock. Secondly, there would be a reduction in livestock numbers during the initial cycle's first year due to grazing system rest requirement and brush control treatment. Reduction would be approximately 25 percent to that level which the remaining pastures would be capable of supporting. This reduction would be due to brush control treatments taking place in some pastures of an allotment. The last impact would occur by the year 2000. At that time, there would be an increase of 133,587 AUMs of forage over the present active use. This increase would be the result of implementing brush control treatments and specific grazing management systems.

In conclusion, there would be an overall increase from 233,885 AUMs to 367,442 AUMs of livestock forage production per year, by the year 2000.

AGRICULTURE

The primary impact of agriculture within the ES area would be on allottees who would be expected to substantially reduce their grazing of livestock on the public lands. However, those allottees who own cropland which is suitable for grazing, would have more flexibility in their choices as to their methods and season of livestock disposal. This private cropland would certainly receive more livestock use following reductions in public grazing privileges. By the year 2000, the use of local cropland should resume its normal function.

SOCIAL CONDITIONS

Under the proposed action, the social well-being of most ranchers with BLM allotments in the ES area would be diminished during the implementation period (approximately 8 years), as reductions in permitted levels of livestock grazing on public lands were made. Following that time, however, their social well-being would improve, with progressive improvement of range conditions and increased levels of grazing. Ranch operators and members of their families emphasized two points in interviews conducted by Harbridge House, Inc., during December, 1978: the attractiveness of ranching and rural lifestyles for themselves and their children, and the importance of a sense of independence and self-reliance to their self-esteem. Initial adjustments in stocking rates on the public range and the planned regulation of permitted grazing would represent negative impacts for most ranchers. Adjustments in herd sizes with "specific grazing management" would cause reduced ranching incomes, and force some ranchers to seek off-ranch employment during the implementation period. Because of the reduced value of the affected ranches, some operators may encounter some difficulties in obtaining loans. In general, the diminished viability of ranches as economic units would make persistence in ranch lifestyles more difficult for some operators (especially small operators) and members of their families in the early and mid-1980's. They would be likely to enter urban, commercial, and industrial sectors of the regional economy in search of jobs and income.

Although initial reduction in permitted grazing on public lands would be reversed by the early 1990's, and ranches would increasingly represent viable economic units after 1984, the fact of proposed federal government regulation of range use would subject ranchers to greater external controls than they presently experience. Ranch operators, particularly those who maintain the attitudes and values of so-called "ranch fundamentalism" most strongly, would feel their historic independence was weakened. Whether or not this perceived change adversely affected the social well-being of ranchers and their families would depend on the degree to which these individuals adjusted to the effect of new regulations. At present, interviews conducted in December, 1978, suggest that the hostility of ranch-operators, their families and their neighbors toward the proposed action stems as much from the idea of government intervention in ranch management as from the specific impacts believed to result from the proposal. Ranchers believe that their operations are being subjected to regulation and interference by bureaucrats and officials who do not share either their basic values or their appreciation of ranch life.

After the implementation period, the proposed action would improve the social well-being of ranch operators and their families by increasing net returns to ranchers and strengthening the viability of ranches. Income of ranchers would rise as herd sizes grew with increased levels of permitted grazing on public lands. Ranch wealth-capital position would increase with additional animal units (AUs), providing ranch operators with an expanded ability to borrow. The growth in the business and personal incomes of ranchers, and their improved wealth positions, would make possible the purchase of more goods and services, and permit the enjoyment of ranch life with a greater sense of security.

ECONOMIC CONDITIONS

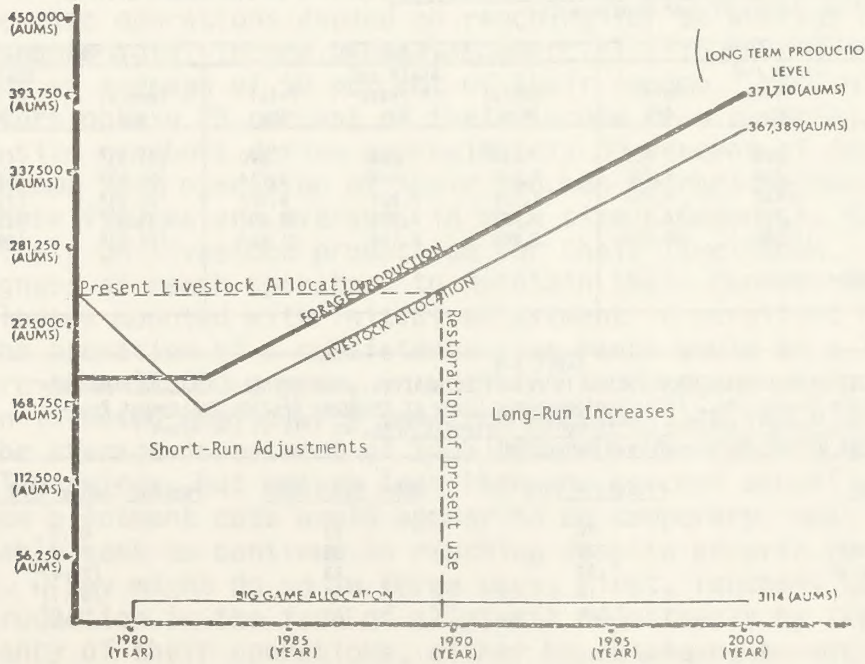
Direct impacts of the proposed action would be experienced principally by the families of the 100 ranch operators holding one or more of the 110 allotments which would be operated under "specific grazing management" systems. No direct impacts are projected for the families of an additional 52 ranchers who have allotments which would be operated under "no specific grazing management." However, these ranchers, other livestock producers in southeastern New Mexico, and workers in industries which are economically linked to range livestock production would be indirectly affected by changes in livestock sales and ranch-related spending stemming from the proposed action. In the context of the regional economy as a whole, projected impacts would be relatively insignificant. However, in the ES area and adjacent rural areas, the impacts of the proposed action would be significant. Adverse impacts on ranch employment, income, and the economic well-being of ranchers are projected during the early 1980's, as permitted grazing in public lands is cut. Beneficial impacts are projected for the late 1980's and 1990's as range improvement proceeds and herd sizes increase.

Specific Grazing Management

The proposed action would directly affect the economic well-being of the families of 100 ranch operators who have one or more allotments which would be placed under "specific grazing management." Of the estimated 600 persons belonging to ranch families with allotments in the ES area, approximately 400 are members of families which would be directly affected by the proposal. Impacts would vary over time. In the short-run, 1981-1984, ranchers would experience cuts in the number of AUs permitted on public lands, averaging 28.4 percent. Hence, employment and income associated with their operations would drop (see Graph 3-1). After 1984, range improvement would lead to gradual

GRAPH 3-1

SHORT-RUN AND LONG-RUN LIVESTOCK ALLOCATION ON PUBLIC LANDS, SHOWING YEAR IN WHICH PRESENT LEVELS WOULD BE RESTORED AND LONG TERM PROJECTED PRODUCTION LEVEL



increases in permitted use, until in 1989, present levels of grazing are expected to be restored. Therefore, by the start of the 1990's, ranchers holding allotments with "specific grazing management systems" would be operating at livestock stocking levels similar to their present Federal Range use, and employment and income associated with their operations would resemble figures prior to 1981. By the year 2000, permitted grazing on public lands would increase by an average of 27.7 percent. As a result, ranch jobs and returns to ranchers would expand significantly.

In the early 1980's, initial adjustments in permitted levels of livestock grazing on public lands would cut federal AUs by an average 27.5 percent, as shown in Table 3-7. Because "specific grazing management" plans would indirectly affect stocking on state and private lands, where these lands are not fenced, projected reductions in herd sizes generally would be even greater, averaging 28.4 percent. Adjustments would vary between ranches in different size categories. Subsistence-size ranches would experience cuts averaging 8.7 percent, while large commercial-size ranches would have reductions in herd sizes of more than 31 percent. As a result of these adjustments, many ranches would be diminished in size, moving out of one size category and into another. The effects of reduction in herd sizes or distribution of ranches by size category are shown in Table 3-8. At one end of the scale, there would be 13 additional ranches with fewer than 75 cattle year long. At the other, there would be 8 fewer ranches with 500 or more head. Because of the short-term nature of reduction in permitted grazing on public lands, no ranch is expected to cease operations entirely, although as explained below, some ranch operators would have to seek off-ranch employment or other new sources of income.

TABLE 3-7

IMPACTS ON HERD SIZES WITH INITIAL ADJUSTMENTS IN PERMITTED GRAZING, WITH SPECIFIC GRAZING MANAGEMENT

(Source: Harbridge House, Inc., 1979, Socioeconomic Study of Proposed Grazing Management Program, East Roswell Grazing Environmental Statement Area, on file at the Roswell District Office, Bureau of Land Management)

	Present - 1978			Short-Run 1983			Percent Change - 1978-1983		
Ranch Category	Federal AUs	State and Private AUs	Total AUs	Federal AUs	State and Private AUs	Total AUs	Federal AUs	State and Private AUs	Total AUs
Subsistence	693	260	953	614	256	870	(11.4)[a]	(1.5)[a]	(8.7)[a]
Small Commercial	3,047	1,734	4,781	2,220	1,494	3,714	(27.1)[a]	(13.8)[a]	(22.3)[a]
Medium Commercial	5,569	3,453	9,022	4,126	2,301	6,427	(25.9)[a]	(33.4)[a]	(28.8)[a]
Large Commercial	9,280	6,233	15,513	6,509	4,143	10,652	(29.9)[a]	(33.5)[a]	(31.3)[a]
All Categories	18,589	11,680	30,269	13,469	8,194	21,663	(27.5)[a]	(29.8)[a]	(28.4)[a]

[a] Parentheses ( ) indicate a negative value.

TABLE 3-8

IMPACTS ON RANCH SIZES WITH INITIAL ADJUSTMENTS IN PERMITTED GRAZING, WITH SPECIFIC GRAZING MANAGEMENT

(Source: Harbridge House, Inc., 1979, Socioeconomic Study of Proposed Grazing Management Program, East Roswell Grazing Environmental Statement Area, on file at the Roswell District Office, Bureau of Land Management)

Ranch Category	Present - 1978	Short Run - 1983	Percent Change 1978 - 1983
Subsistence	20	33	65.0
Small Commercial	37	38	2.7
Medium Commercial	29	23	(20.7)[a]
Large Commercial	14	6	(57.1)[a]
All Categories	100	100	0.0

[a] Parentheses ( ) indicate a negative value.

The economic effects of initial adjustments in permitted levels of grazing would be felt immediately by ranchers whose livestock sales would first climb, as they reduced their herds, and then fall sharply, as a result of diminished production. By 1984, livestock sales from the ES area would decline by more than $1.5 million a year. Consequently, net cash income for ranchers would drop by nearly $1.1 million and average percent return on investment would decrease from 1.3 percent in 1978 to -0.1 percent in 1984. While these adverse impacts of the proposed action would be temporary, they would be severe. Table 3-9 shows the effects of the initial adjustments on the costs, receipts and returns of typical ranches in four size categories. The typical subsistence-size ranch had a net cash income of approximately $2,411 in 1978. With the 7.7 percent cut in herd sizes contained in the proposed action, net cash income would drop by 22.4 percent, or $541, to $1,870 in 1984. The typical small commercial-size ranch had a net cash income of $16,385 in 1978. In 1984, net cash income for the same typical ranch would be $11,878, a decline of $4,507 or 38 percent. The net cash income of typical medium commercial and large commercial-size ranches would decrease by $14,164 or 30 percent for the former, and by $33,709 or 34 percent for the latter. The aggregate costs, receipts, and returns of affected ranches in the ES area are shown in Table 3-10. For the 100 ranch units, net cash income in 1984 would be $2,360,682, 31 percent less than in 1978. Net business income would be $748,364, 59 percent less. Returns to ranch operators for their labor would be cut by more than $166 thousand. Returns to ranch operators as interest on invested capital would be eliminated. Drops in ranch income would be made less severe to the extent that ranch operators have other income sources. Interviews with ranchers in the ES area indicate that operators with subsistence-size operations depend on ranching for an average of only 10 percent of their total income. Small commercial-size ranchers depend on ranching for an average of 50 percent of their income. Medium commercial size operators obtain 75 percent of their income from ranching. Large commercial-size ranchers derive approximately 80 percent of their total personal income from operation of their ranches (Harbridge House, 1979). However, these figures are averages in each size category, a few ranchers depend entirely on livestock production for their livelihood. Moreover, the willingness of ranch operators to maintain their ranches would be tested as losses mounted with initial adjustment in permitted grazing. By 1984, the operation of a subsistence-size ranch would be a luxury costing more than $2,000 a year, in addition to foregone wages and earnings on invested capital. A small commercial-size ranch would lose money on the average investment of $408,000. Larger ranches would have some actual earnings, but return less than one percent annually.

Because allotment cuts would appear to be temporary, most ranchers would probably seek to continue in ranching despite adverse economic conditions. They might do so in three ways; first, ranchers might increase production in the face of allotment adjustments by improving the efficiency of their operations, either by obtaining an increased

TABLE 3-9

TYPICAL COSTS, RECEIPTS, AND RETURNS FOR LIVESTOCK FOR LIVESTOCK RANCHES, ES AREA 1984, WITH SPECIFIC GRAZING MANAGEMENT
(in 1978 constant dollars)
(Source: Harbridge House, Inc., 1979, Socioeconomic Study of Proposed Grazing Management Program, East Roswell Environmental Statement Area, on file at the Roswell District Office, Bureau of Land Management)

Budget Items	Subsistence Size Ranch 33 AUs[d]	Small Commercial Size Ranch 106 AUs[d]	Medium Commercial Size Ranch 248 AUs[d]	Large Commercial Size Ranch 525 AUs[d]	Total All Ranches 19,124 AUs
Number of Ranch Units	20	37	29	14	100
Livestock Sales (Receipts)	$ 7,565	$ 25,268	$ 56,354	$ 114,705	$ 43,264
Operating Costs (Ranch)	5,695	13,390	22,868	49,512	19,657
Net Ranch Cash Income	$ 1,870	$ 11,878	$ 33,486	$ 65,193	$ 23,607
Depreciation Allowance	4,059	9,506	20,412	41,962	16,123
Net Ranch Income	$ (2,189)[c]	$ 2,372	$ 13,074	$ 23,231	$ 7,484
RETURNS:					
To operator for labor[a]	$ 0	$ 2,372	$ 8,125	$ 8,125	$ 4,371
To operator for interest[b]	$(10,314)[c]	$ (5,753)[c]	$ 4,949	$ 15,106	(641)[c]
CAPITAL INVESTMENT	$137,330	$407,780	$998,720	$2,143,650	$768,084
PERCENT RETURN ON INVESTMENT	(7.5)[c]	(1.4)	0.5	0.7	(0.1)[c]

[a] Return to operator for labor calculated with base rate of $8,125 or $3.25 an hour minimum wage, for 50 hours a week, 50 weeks a year.

[b] Return to operator for interest calculated on return remaining after labor compensation.

[c] Parentheses ( ) indicate a negative value.

[d] Average size ranch.

TABLE 3-10

AGGREGATE COSTS, RECEIPTS, AND RETURNS FOR LIVESTOCK RANCHES, ES AREA, 1984, WITH SPECIFIC GRAZING MANAGEMENT
(in 1978 constant dollars)
(Source: Harbridge House, Inc., 1979, Socioeconomic Study of Proposed Grazing Management Program, East Roswell Environmental Statement Area, on file at the Roswell District Office, Bureau of Land Management)

Budget Items	Subsistence Size Ranch 33 AUs[d]	Small Commercial Size Ranch 106 AUs[d]	Medium Commercial Size Ranch 248 AUs[d]	Large Commercial Size Ranch 525 AUs[d]	Total All Ranches 19,124 AUs
Number of Ranch Units	20	37	29	14	100
Livestock Sales (Receipts)	$ 151,300	$ 934,916	$ 1,634,266	$ 1,605,870	$ 4,326,352
Operating Cost (Ranch)	113,900	495,430	663,172	693,168	1,965,670
Net Ranch Cash Income	$ 37,400	$ 439,486	$ 971,094	$ 912,702	$ 2,360,682
Depreciation Allowance	81,180	351,722	591,948	587,468	1,612,318
Net Ranch Income	$ (43,780)[c]	$ 87,764	$ 379,146	$ 325,234	$ 748,364
RETURNS:					
To operator for labor[a]	$ 0	$ 87,764	$ 235,625	$ 113,750	$ 437,139
To operator for interest[b]	(206,280)[c]	(212,861)[c]	143,521	211,484	(64,136)[c]
CAPITAL INVESTMENT	$2,746,600	$15,087,860	$28,962,880	$30,011,100	$76,808,440
PERCENT RETURN ON INVESTMENT	(7.5)[c]	(1.4)[c]	0.5	0.7	(0.1)[c]

[a] Return to operator for labor calculated with base rate of $8,125 or $3.25 an hour minimum wage, for 50 hours a week, 50 weeks a year.

[b] Return to operator for interest calculated on return remaining after labor compensation.

[c] Parentheses ( ) indicate a negative value.

[d] Average size ranch.

calving percentage or by obtaining an increased selling weight of marketed livestock (Peryan and Alsor, 1975). In interviews conducted by Harbridge House, Inc., with ranchers in the ES area, some reported calving percentages as low as 65 percent, and selling weights were variable. However, some of the practices which might be used to increase ranch efficiency would add substantially to costs, diminishing their marginal utility to ranchers. Such practices would include use of more feed and purchases of high quality bulls and replacement heifers. Data obtained in ranch budget interviews do not suggest that there is much ability to increase efficiency.

Second, ranchers might maintain present levels of production by leasing more expensive private land on which they would graze cattle which were no longer permitted on public lands. Operators owning farms might turn cropland over to cattle grazing, a decision dependent on comparative market prices for crops grown and beef produced. Operators not owning farms or farmland might lease available pasture and cropland. This increased utilization of private land would be a short-term condition induced by the initial adjustments in permitted grazing on public lands, and would be dependent on market demand for such land and resulting prices for leasable acreage. Further, subsistence-size and small commercial-size ranchers might combine their private land with that of adjacent larger ranch operators in share-leased or joint management arrangements. In this way, efficiencies of scale might be maintained.

Third, ranchers might continue with their operations by not making full allowance for depreciation. By not maintaining improvements and machinery, and not replacing obsolescent or defective equipment they might conserve their capital in the 1980s. Ranch operators would defer new capital expenditures, and seek simply to cover operating costs with cash income. In this way, neglecting the cumulative costs of depreciation and ignoring the opportunity costs of labor and capital, ranchers would survive short-run adverse conditions. "In the long-run, ranchers may be able to overcome most adjustments in use that may occur. This does not suggest that incomes or the wealth position of ranchers will not decrease, but it does suggest that ranchers may be more resilient to changes in the use of federal lands than has been suspected in the past" (Godfrey, 1978). The basis of this resiliency is the noneconomic commitment to a ranching lifestyle, described as "ranch fundamentalism" in Chapter 2.

Reductions in grazing on public lands would adversely affect the ability of ranchers to borrow finance capital, unless AUMs cut initially were replaced immediately with AUMs on private and state land. The ranch wealth-capital position is appraised at approximately $1,000 for each animal unit of production and adjustments in stocking would cut the value of ranches in the ES area by more than $8 million in the short-run. Institutions now loan at 40-60 percent of market value. Consequently, the ability of ranchers to borrow money would be diminished by at least $3.5 million during this period. At the same time, projected decreases in livestock sales would diminish ranch operators' capacity to pay the principal and interest on outstanding loans. A short-run shortage of finance capital would, therefore, develop along with the short-run decline in ranch income, limiting the options open to ranchers in adjusting to allotment cuts.

Short-run decreases in ranch returns to operators, and temporary reductions in their ability to borrow finance capital, would force certain livestock ranchers, not presently employed off the ranch, to find part-time or full-time jobs elsewhere, and lead ranchers already employed elsewhere to concentrate more of their energies on their off-ranch jobs. Of the 100 ranch operators to be affected by initial adjusted grazing levels, an estimated 38 presently hold nonranch jobs. With the proposed action, an additional 15 ranchers would be temporarily pressed to seek such employment, while approximately 8-10 part-time and full-time ranch workers would lose their jobs. Because of the temporary nature of allotment cuts, ranch operators and workers might be willing to hold on to their ranches or to remain in the area pending projected increases in permitted levels of grazing on public lands. It is, therefore, uncertain whether many individuals would sell out or leave the ES area. The economic hardship endured by those who choose to persist, however, would be severe. On the average, incomes from ranching during the early 1980's would be 26 percent less than in 1978.

Ranch incomes would increase in the late 1980's as public lands were improved and permitted grazing was increased. By 1990, levels of income and employment existing prior to 1981 would be restored. By the year 2000, with completion of vegetative treatments and capital improvements on public lands, permitted levels of livestock grazing under "specific grazing management" systems would rise 27.7 percent above 1978 levels. The projected increases would not necessarily occur in a linear fashion, because chemical spraying might itself require further, temporary cuts in permitted grazing, and construction of fences and waters would proceed on an allotment basis. However, an eventual increase in animal units on federal acres would result by the end of the century, as shown in Table 3-11. Because of the increase, the size distribution of ranchers

TABLE 3-11

IMPACTS ON HERD SIZES WITH LONG-RUN CHANGES IN PERMITTED GRAZING, WITH SPECIFIC GRAZING MANAGEMENT

(Source: Harbridge House, Inc., 1979 Socioeconomic Study of Proposed Grazing Management Program, East Roswell Grazing Environmental Statement Area, on file at the Roswell District Office, Bureau of Land Management)

	Present-1978			Long-run-2000			Percent Change - 1978-2000		
Ranch Category	Federal AUs	State & Private AUs	Total AUs	Federal AUs	State & Private AUs	Total AUs	Federal AUs	State & Private AUs	Total AUs
Subsistence	693	260	953	1,376	256	1,632	135.5	(1.5)[a]	71.2
Small Commercial	3,047	1,734	4,781	4,789	1,494	6,283	57.2	(13.8)[a]	31.4
Medium Commercial	5,569	3,453	9,022	8,229	2,301	10,530	47.8	(33.4)[a]	16.7
Large Commercial	9,280	6,233	15,513	16,052	4,143	20,195	73.0	(33.5)[a]	30.2
All Categories	18,589	11,680	30,269	30,446	8,194	38,640	63.8	(29.8)[a]	27.7

[a] Parentheses ( ) indicate a negative value.

in the ES area would change. Table 3-12 indicates that, in the year 2000, there would be five fewer subsistence-size operations than in 1978 and 18 fewer such ranches than in 1984. By contrast, there would be one more large commercial-size ranch than in 1978 and nine more than in 1984.

TABLE 3-12
IMPACTS ON RANCH SIZES WITH LONG-RUN CHANGES IN PERMITTED GRAZING, WITH SPECIFIC GRAZING MANAGEMENT
(Source: Harbridge House, Inc., 1979, Socioeconomic Study of Proposed Grazing Management Program, East Roswell Grazing Environmental Statement Area, on file at the Roswell District Office, Bureau of Land Management)

Ranch Category	Present-1978	Long-run-2000	Percent Change, 1978-2000
Subsistence	20	15	(25.0)[a]
Small Commercial	37	39	5.4
Medium Commercial	29	31	6.9
Large Commercial	14	15	7.1
All Categories	100	100	100

[a] Parentheses ( ) indicate a negative value.

The costs, receipts and returns for typical ranches in four size categories are given in Table 3-13.

TABLE 3-13
TYPICAL COSTS, RECEIPTS, AND RETURNS FOR LIVESTOCK RANCH, ES AREA, 2000, WITH SPECIFIC GRAZING MANAGEMENT
(In 1978 constant dollars)
(Source: Harbridge House, Inc., 1979, Socioeconomic Study of Proposed Grazing Management Program, East Roswell Grazing Environmental Statement Area, on file at the Roswell District Office, Bureau of Land Management)

Budget Items	Subsistence Ranch Size 62 AUs[d]	Small Commercial Ranch Size 178 AUs[d]	Medium Commercial Ranch Size 411 AUs[d]	Large Commercial Ranch Size 978 AUs[d]	Total, All Ranches 33,437 AUs
Number of Ranch Units	20	37	29	14	100
Livestock Sales (Receipts)	$ 14,345	$ 35,186	$ 90,851	$216,480	$ 72,542
Operating Cost (Ranch)	8,235	14,364	33,929	86,425	28,901
Net Ranch Cash Income	$ 6,110	$ 20,822	$ 56,922	$130,055	$ 43,641
Depreciation Allowance	4,059	9,506	20,412	41,962	16,123
Net Ranch Income	$ 2,051	$ 11,316	$ 36,510	$ 88,093	$ 27,518
RETURNS:					
To operator for labor[a]	$ 2,051	$ 8,125	$ 8,125	$ 8,125	$ 6,910
To operator for interest[b]	(6,074)[c]	3,191	28,385	79,968	19,393
CAPITAL INVESTMENT	137,330	407,780	998,720	2,143,650	768,084
PERCENT RETURN ON INVESTMENT	(4.4)	0.8	2.8	3.7	2.5

[a] Return to operator for labor calculated with base rate of $8,125 or $3.25 an hour minimum wage, for 80 hours a week 50 weeks a year.
[b] Return to operator for interest calculated on return remaining after labor compensation.
[c] Parentheses ( ) indicate a negative value.
[d] Average size ranch.

By the year 2000, with the proposed action, livestock sales would increase for all ranches. The combined gain would be equal to $1.4 million over sales in 1978, and $2.9 million over sales in 1984. Net cash income would rise sharply over 1978 levels. For subsistence-size ranches, net cash income would increase from $5,696 to $8,235, a 45 percent gain. For small commercial-size ranches, net cash income would grow from $16,385 to $20,822, a 27 percent gain. Percentage increases for medium commercial and large commercial-size ranches would equal 19.4 and 31.5, respectively. Aggregate costs, receipts, and returns for ranches in the ES area having allotments with specific management plans are shown in Table 3-14. Net business income of ranch operators would be $2,751,804 in the year 2000, up by $900,000 over net business income in 1978 and up by $2 million over income in 1984. Average percentage return on investments in these ranches would grow from 1.3 in 1978, and -0.1 in 1984, to 2.5 at the end of the century. Long-run increases in livestock stocking would also restore the original rancher wealth-capital position and provide for an increased ability to borrow money amounting to approximately $3.3 million. This would provide increased capital, broadening the options open to ranchers with "specific grazing management" and reducing the need for borrowing. However, ranch wealth-capital position is affected only if the ranch is sold, transferred, or used as collateral for loans.

TABLE 3-14
AGGREGATE COSTS, RECEIPTS, AND RETURNS FOR LIVESTOCK RANCHER, ES AREA, 2000, WITH SPECIFIC GRAZING MANAGEMENT
(in 1978 constant dollars)
(Source: Harbridge House, Inc., 1979, Socioeconomic Study of Proposed Grazing Management Program, East Roswell Grazing Environmental Statement Area, on file at the Roswell District Office, Bureau of Land Management)

Budget Items	Subsistence Ranch Size 62 AUs[d]	Small Commercial Ranch Size 178 AUs[d]	Medium Commercial Ranch Size 411 AUs[d]	Large Commercial Ranch Size 978 AUs[d]	Total, All Ranches 33,437 AUs
Number of Ranch Units	20	37	29	14	100
Livestock Sales (Receipts)	$ 286,900	$ 1,301,882	$ 2,634,679	$ 3,030,720	$ 7,254,181
Operating Cost (Ranch)	164,700	531,468	983,941	1,209,950	2,890,059
Net Ranch Cash Income	$ 122,200	$ 770,414	$ 1,650,738	$ 1,820,770	$ 4,364,122
Depreciation Allowance	81,180	351,722	591,948	587,468	1,612,318
Net Ranch Income	$ 41,020	$ 418,692	$ 1,058,790	$ 1,233,302	$ 2,751,804
RETURNS:					
To operator for labor[a]	$ 41,020	$ 300,625	$ 235,625	$ 113,750	$ 691,020
To operator for interest[b]	(121,480)[c]	118,067	823,165	1,119,552	1,939,304
CAPITAL INVESTMENT	$2,746,600	$15,087,860	$28,962,880	$30,011,100	$76,808,440
PERCENT RETURN ON INVESTMENT	(4.4)[c]	0.8	2.8	3.7	2.5

[a] Return to operator for labor calculated with base rate of $8,125 or $3.25 an hour minimum wage, for 50 hours a week 50 weeks a year.
[b] Return to operator for interest calculated on return remaining after labor compensation.
[c] Parentheses ( ) indicate a negative value.
[d] Average size ranch.

The effect of this long-term improvement would be lessened for ranchers who had diverted funds from allowances for depreciation or taken loans or mortgages in order to survive the 1980's, and confronted deferred depreciation costs on scheduled repayments of principal and interest.

No Specific Grazing Management

No direct impacts are projected on ranchers who would be subject to "no specific grazing management" under the proposed action. Adjustments in permitted grazing levels on these allotments would cut ranch sizes by an average of 1.8 percent (Harbridge House, Inc., 1979). This change is statistically insignificant, and would not be expected to produce measurable impacts, especially inasmuch as present patterns of use of public, private, and state lands would shift in response to initial adjustments, and the overall slight decrease in federal AUM's might be matched by a corresponding slight increase in private and state AUM's.

REGIONAL ECONOMIC IMPACTS

The short-run and long-run changes in permitted levels of grazing on public lands would have negligible effects on the population and economy of southeastern New Mexico as a whole. Decreases in ranch income in the 1980's would represent less than 0.2 percent of total personal income in Chaves, Eddy, and Lea Counties. Indirect impacts on employment and income would also be minimal, with fewer than 60 jobs displaced in 1983, or less than 0.2 percent, and fewer than 70 jobs created by the year 2000, or less than 0.1 percent of projected employment. The proposed grazing management program would itself entail expenditures in the region of between $350,000 and $700,000 million annually. The economic stimulus of this spending during the 1980's would offset any short-term adverse impacts from allotment reductions.

Indirect impacts from the proposed action would be felt by ranch operators not having allotments in the ES area, and by workers in economic sectors closely tied to livestock production, in the short-run. Ranchers with lands outside the ES area, as well as other owners of land suitable for grazing, would experience increased demand for leases and lease prices would rise. The rancher's wealth-capital position which is not dependent on public lands for a large portion of their AUs would temporarily be increased. Costs of ranch labor might decline in the 1980's, due to diminished opportunities for employment in the ES area and, consequently, affect operating costs of ranches elsewhere in southeastern New Mexico. Demand for feed, ranch machinery and equipment, and agricultural services would decline as production in the ES area dropped in the short-run.

Some businessmen would experience temporary reductions in their sales volumes. Of the fewer than 60 jobs indirectly affected, approximately 40 would be located in the trade and service sectors. By 1990, these jobs would be restored, trade and service sales related to ranching would climb back to levels existing prior to 1981, and demand for leases would decline. Long-run expansion of ranching activity in the ES area would strengthen businesses in related sectors and gradually add to employment after 1990.

No significant impacts on the regional economy would result from the increased number of fishing and hunting days on public lands with the proposed action. Most of these days are projected to be spent by present and future residents of southeastern New Mexico, and no immigration of hunters and fishermen from outside the region is projected.

Summary and Conclusion

Increased stocking rates between 1984 and 1989 would have positive social and economic effects on the ES area and the economy of southeastern New Mexico. However, adjustments in permitted levels of grazing between 1980 and 1984 would have temporary negative social and economic effects. Between 1981 and 1984 livestock sales from ranches in the study area would decline by $1.5 million from 1978 levels. This decrease in ranch income in the 1980's would represent less than 0.2 percent of total personal income in Chaves, Eddy and Lea Counties. Indirect impacts on employment and income would also be minimal with approximately 60 jobs displaced in 1983, or less than 0.1 percent of projected employment. In addition to the estimated, 38 operators presently holding off-ranch employment, 15 operators may have to obtain such employment to supplement their ranch income and 8 to 10 ranch workers may have to be laid off. Rancher's wealth-capital position would have also dropped by $8.5 million, limiting the ability of ranchers to borrow against collateral.

As range improvements begin to affect forage production in 1984, economic conditions for ranch operators in the ES area would improve. Ranch operations would be more profitable, and the 15 ranchers who took off-ranch jobs in the 1980's would no longer need to hold them and an additional 4 to 5 operators would be able to leave such jobs. The estimated 8-10 ranch worker jobs lost between 1981 and 1984 would be regained along with an additional two jobs. Related jobs in other economic sectors would also be restored and increased. Financing problems for most ranchers would be alleviated by increased income and gains in the ranch wealth-capital position. These improvements would continue to occur through the year 2000 and the economic conditions achieved by that date are expected to be maintained thereafter.

Between 1984 and 2000, the proposed grazing management program would itself entail expenditure in the region of between $750,000 and $1.5 million annually. The economic stimulus of this spending during the early 1980's would offset any regional economic impact from allotment reductions.

CHAPTER 4

MITIGATING MEASURES NOT INCLUDED IN THE PROPOSED ACTION

Chapter 4

MITIGATING MEASURES NOT INCLUDED IN THE PROPOSED ACTION

Most mitigation proposed was developed through the Bureau of Land Management's planning system and is, therefore, included in Chapter 1 as a part of the proposed action. These measures are covered in the section dealing with standard operating procedures. Only these measures developed through the environmental statement process and which are site-specific are included in the following discussion. It lists the impact, the appropriate mitigating measure, and the reduction due to mitigation. If the proposed action is implemented, the Bureau of Land Management is committed to these measures.

Wildlife

Impact: Uncontrolled grazing on allotments without "specific grazing management".

Mitigating Measure: Establish 10-20 acre exclosures on the following allotments where legal access is available:

Allotment number	Number of Exclosures	Acreage of Exclosures
5004	1	20
5005	1	20
5011	1	20
6048	2	20
7001	1	10
7023	1	20

Reduction Due to Mitigation: Exclosures would create islands of habitat in an unstable situation. Nesting grassland birds, small mammals, snakes, and predators would benefit. As long as islands of habitat were scattered area-wide, the mitigation of this impact could be reduced from major to minor.

Cultural Resources

Impact: The chemical treatment of range plants would have an effect on cultural resources as previously identified in Chapter 3. Chemical spraying has the potential for adding fresh carbon to radiocarbon samples. However, the standard decontamination process for radiocarbon samples which is undertaken by radiocarbon laboratories should compensate for any contamination caused by herbicides. If the radiocarbon laboratory is aware of the possibility of contamination from diesel oil, they should be able to deal with the problem.

Mitigating Measures:	The standard operating procedures of radiocarbon laboratories would mitigate much of the effect of herbicides on cultural resources. The cultural resource program of BLM's Roswell District should properly identify those areas which are sprayed so that future excavators of those areas would be informed of the possibility of contamination of radiocarbon samples. This information should then become a part of the antiquities permit which would be issued for those sites.
Reduction Due to Mitigation:	The accuracy of carbon dating for artifacts would be more precise.

CHAPTER 5

ADVERSE IMPACTS WHICH CANNOT BE AVOIDED

Chapter 5

ADVERSE IMPACTS WHICH CANNOT BE AVOIDED

Data contained within this chapter represents an analysis of those unavoidable adverse impacts which would result from implementation of the proposed action. Impacts considered are those adverse impacts which were analyzed in Chapter 3 and either unmitigated or only partially mitigated by actions discussed in Chapter 4.

Only major adverse impacts are analyzed as unavoidable. There were no adverse impacts affecting the physical setting, air quality, water, recreation, or visual resources which were considered as unavoidable.

Vegetation

During the short-run, some nontarget vegetation would be killed as a result of brush control programs. Aerial spraying to control mesquite would defoliate, but not kill, nontarget shrubs such as shinnery oak, littleleaf sumac, sand sagebrush, and catclaw acacia for up to one year.

Range condition would remain static or decline on allotments without specific grazing management proposed (76,882 public land acres).

Soils

On the approximately 961,000 acres to be treated with herbicides, there would be a short-run increase in soil erosion. On the 520 acres of grassy draws to be burned, there would be a short-run increase in soil erosion in these areas. Establishment of 246 watering sites (125 acres) for livestock would have a long-run adverse impact on soils. Vegetation on about one-half acre around each watering site would be trampled by livestock, thus increasing soil erosion. A short-run increase in soil erosion would be expected from the construction of 203 miles of fence (approximately 175 acres). Another short-run increase in erosion would occur from implementation of mechanical brush control treatments on 440 acres in the ES area.

Wildlife

Because cattle would have complete access to 164 unfenced dirt tanks, aquatic or emergent vegetation would have little chance to become established in these tanks. This would limit habitat for amphibians, aquatic reptiles, or aquatic birds.

The quality of habitat for brush-adapted wildlife would be reduced on 464,000 acres, if brush control projects were successful. Moderate utilization of forage during drought years would possibly degrade nesting opportunities for birds in the following year by removing vegetation (grass) needed for nest construction.

Grazing could also be a problem to nesting birds after territories have been established and birds become reluctant to move on to establish new nesting sites. The major impact would be the disturbance of nests by livestock activity.

Cultural Resources

Continued disturbance of all cultural resource sites by livestock is an unavoidable adverse impact of the proposed action.

Forty range improvements on 18 allotments would provide additional access to approximately 70,000 acres. Pothunting tends to increase when additional access is provided. Increased pothunting is an adverse impact of the proposed action which is unavoidable.

Livestock Grazing

Stocking rates for all 184 allotments in this ES area would be adjusted to the level set by the 1977-1978 range survey. This would be a net decrease of 65,779 animal unit months (AUMs) from the existing licensed use.

Movement of livestock between pastures on existing AMPs and on proposed "specific grazing management" allotments would be expected to cause a temporary weight loss in these animals.

Livestock exclosures on 24 allotments would withdraw 870 AUMs from livestock use permanently.

Ranchers would experience a greater workload because both present and proposed improvements would require maintenance.

Economic Conditions

Initial adjustments in permitted levels of grazing would have short-run (8-10 years) unavoidable adverse impacts on the economic and social well-being of ranchers having allotments in the ES area. By 1984, livestock sales from ranches with "specific grazing management" systems would have declined by $1.5 million, or 27 percent. Following 1984, these conditions would start to improve and, by 1989, would reach a level which would be comparable to the present level of livestock sales. However, during the period prior to 1984, net cash income to ranch operators would have dropped by nearly $1.1 million, or 31 percent. As many as 8 ranchers may have had to obtain temporary part-time or full-time jobs off the ranch to supplement their diminished incomes from ranching. An estimated 4-5 ranch workers would have been laid off and approximately 30 jobs in other economic sectors would have been displaced. The ability of ranch operators to borrow money would have been reduced by at least $3.5 million because the reductions in stocking on public lands would have cut ranch wealth-capital position. Some operators could experience severe problems in financing ranch businesses. Because initial adjustments would have diminished the economic viability of the ranch unit, ranchers would have encountered increased difficulties in maintaining present lifestyles. By 1984, this economic loss would begin to be reversed.

CHAPTER 6

SHORT TERM USE AND LONG TERM PRODUCTIVITY

Chapter 6

SHORT-TERM USE AND LONG-TERM PRODUCTIVITY

This chapter summarizes the tradeoff between short-term uses of the environment with the proposed action and the long-term productivity. Short-term is the time it would take to reach the objectives of the proposed action at the year 2000. The long-term productivity refers to the enhancement, maintenance, or decline of resources after the year 2000 as a result of the proposed action.

Table 6-1 summarizes both the short-term and long-term impacts and the tradeoffs necessary to achieve the long-term impacts.

In the short-term, mesquite and creosote would be effectively controlled on approximately 961,000 acres through the use of chemical and mechanical treatments. Allotment-specific grazing management would be implemented on 1,513,312 acres. Vegetative ground cover on this total acreage would improve. Over the long-term, overall improvements of range condition would be sustained. Vegetative production would increase 112 percent over present production. The effects of short-term damage to vegetation would be traded in order to gain a long-range improvement in range condition.

During the short-term, approximately 1,489,000 acres under allotment-specific grazing would have an average decrease of 20 percent in soil erosion while soil productivity would increase. Four hundred forty acres which are to undergo mechanical treatments, and the approximate 961,000 acres expected to undergo chemical treatments, are expected to undergo an increase in erosion at the time of initial treatments. Long-term effects on soils would be a sustained erosion rate which would be 20 percent lower than present rates on approximately 1,489,000 acres under allotment-specific grazing management. Soil productivity would be sustained at a higher level than at present. Trades in resource values would result in increased erosion during the short-term in exchange for lower erosion rates and an increase in soil productivity over the long-term.

During the short-term, there would be a reduction in localized run-off (less than 1 percent) from the additional ground cover (mainly litter). More water would enter the soil and less sediment (less than 1 percent) would be carried in the water, improving water quality and increase the onsite recharge or ground water. In the long-term the decreased run-off, decreased sediment and increased recharge would continue. No trades in resource values would be made.

Brush control treatments would reduce shrub habitat by 464,000 acres. Approximately 164 aquatic habitat areas (82 acres) within the dirt tanks would continue to deteriorate. The installation of fencing would permit thirty-two aquatic habitat areas within dirt tanks (16 acres) and seven protected playas (35 acres) to become productive and seventeen broadleaf tree habitats (10 acres) to maintain themselves and expand. Ground-nesting birds would suffer possible disturbance of their nests on 702,000 acres to 1,053,000 acres annually. Allocations of forage to big game, combined with adjustments in livestock numbers and moderate utilization of forage, would bring population levels within big game habitats to a reasonable carrying capacity. New watering sites in big game ranges would help stabilize populations, but would also result in moderate to heavy use of areas which had previously been used lightly. Fences (203 miles) would help stabilize populations, but would also result in moderate to heavy use of areas which had previously been used lightly. Fences (203 miles) would become additional barriers for some wildlife. Long-term effects on wildlife would be the same as those described for the short-term. Treatments to control brush, followed by "specific grazing management," would permit 566,400 acres of short and mid-grass habitats to reach prime condition, benefiting grassland wildlife. Brush-adapted wildlife would benefit from an improvement in ground cover on 70,000 acres of mixed desert shrub habitat. Range conditions for animals living in the shinnery oak/bluestem habitat (lesser prairie chicken, mule deer, antelope) would be expected to vary from fair to good on 517,000 acres. The loss of brushy habitat on 464,000 acres would be traded off for the same acreage gained in reclaimed grassland.

In the short-term, increased soil losses for approximately 2 years would result in an accelerated loss of cultural resources. Concentrations of livestock would also accelerate site deterioration. Under specific weather conditions, herbicides would have a short duration effect on cultural resources. Over the long-term, watershed conditions would be improved, contributing to the protection of cultural resources. Loss of cultural sites due to erosion would decrease, although loss due to livestock concentration would continue, but to a lesser degree. Over the long-term, herbicides would have a negligible effect on the dating of sites. Increased erosion in the short-term would be traded off for improved watershed condition and decreased rates of cultural site deterioration.

During the 8-year implementation period (the short-term) adverse contrast ratings would be caused by surface disturbances associated with the construction of livestock facilities. Impacts to visual resources would be reduced over the long-term. Some visual resource values would be traded off over the short-term in order to achieve an overall improvement of these resources throughout the ES area.

In the short-term, there would be a slight increase in recreational hunting opportunities brought about by new water facilities. There would be a slightly detrimental impact on the use of off-road vehicles (ORV) brought about by additional fencing. During the long-term, impacts would be the same as those for the short-term.

During the short-term, the present 233,885 licensed livestock AUM's would be reduced on 154 allotments and would increase on 30 allotments. A total of 168,111 AUMs would be available to livestock after the adjustment. This would be a 65,744 AUM reduction from present licensed use. During the 8-year implementation period, there would be a cumulative loss of 526,000 AUMs over the entire ES area from the current level of production which could be projected, if the present AUM level were to be continued over this 8-year period. After 8 years, and before the year 2000, licensed livestock AUMs would increase to 366,885 AUMs per year. This would be an increase of 133,000 AUMs over the present level of licensed AUMs. By the year 2000, the 526,000 cumulative AUMs lost during the first 8 years would be regained, in addition to increases in production. Over the long-term, 336,885 licensed livestock AUMs would be available each year. An 8-year reduction of 65,774 AUMs over the short-term would be traded off for an increase of 133,000 AUMs each year during the long-term.

As adjustments in permitted levels of grazing are made between 1981 and 1984, livestock sales, rancher's wealth-capital position, and employment which is either directly or indirectly related to the livestock industry would be reduced. However, increases in stocking rates between 1984 and the year 2000 would reverse the effects of this negative trend.

Sales of range livestock in the ES area would reach their low point in 1984, $1.5 million below the 1978 level. However, as stocking rates are increased between 1984 and 1989, as shown in Graph 3-1, livestock sales would return to the 1978 level and continue increasing until the year 2000, reaching a total sales level of $7.2 million. While reduced sales of range livestock between 1981 and 1989 would result in a net cumulative loss to the ES area's economy of $3.4 million from the 1978 level, steadily increasing sales between 1989 and the year 2000 would reverse these losses and would produce during the period of time a net cumulative gain of $7.1 million above the sales level achieved in 1978.

Because of the ES area's diminished income from the sale of range livestock, 15 more ranchers, in addition to those (38) ranchers now holding jobs off their ranches would need to seek full or part-time employment to supplement these temporary losses in their ranch income. Also, an estimated 8 to 10 ranch workers would be laid off. Approximately 60 jobs in other economic sectors would be displaced temporarily during the period that grazing levels would be reduced. Most of these jobs would be in the trade, food processing, and retail industries.

As range conditions improve and stocking rates are increased between 1984 and 1989, the availability of jobs in the ES area would also improve and those jobs lost during the 1980-84 grazing reduction period would be replaced as the livestock and other associated industries recover.

Between 1980 and 1984, ranch operators would experience short-term financial problems as rancher's wealth-capital position reach a low point of about $8 million in 1984. Because of these losses, ranch operators would have more trouble repaying outstanding loans, however, as stocking rates are again increased, this trend would be reversed, rancher's wealth-capital position of their ranches would increase above the 1978 level, and livestock sales would increase. By 1989, rancher's wealth-capital positions would return to the present level and would steadily increase through the year 2000. The social well-being of ranching families would be improved with the renewed economic viability of the ranch unit.

In the long-term, the institution and maintenance of specific grazing management systems and range improvement would strengthen ranching in the ES area, both as an economic activity and a sociocultural community. Projected levels of livestock grazing on public lands would add to ranch incomes and make possible the continuation of operators and their families in ranching lifestyles.

Losses involved in the short-run institution of "specific grazing management" systems and the resulting temporary economic dislocation would be exchanged for long-run improvement in productivity of the public lands and expansion of the ranching units, with a consequent strengthening of the ranch unit in the ES area and in support of the ranching lifestyle over the long-term.

TABLE 6-1
SHORT-TERM VERSUS LONG-TERM PRODUCTIVITY
(Source: Chapter 3)

Resource	Short-Term	Long-Term	Tradeoffs
Vegetation	Mesquite and creosote would be effectively controlled on approximately 961,000 acres through the use of chemical and mechanical treatments. Allotment-specific grazing management would be implemented on 1,513,312 acres. Vegetative ground cover on this total acreage would improve and soil moisture would increase along with an increase in soil nutrients. Lack of treatments to control shinnery oak and mesquite on approximately 500,000 acres would allow range conditions to deteriorate.	Brush control projects would be maintained to insure that severe infestations of brush do not reoccur. Overall improvements of range condition would be sustained except on allotments which do not have specific grazing management programs and/or would not be treated to control brush.	Short-term damage to vegetation, caused by projects to improve the range (e.g.: removal of mesquite and creosote), would result in improvements of the range condition: production, composition, vegetative ground cover, over the long-term.
Soils	On the approximate 1,489,000 acres under allotment specific grazing, there would be an approximate average decrease in soil erosion by 20 percent and soil productivity would increase. On the 440 acres which are proposed to undergo mechanical treatments and on the approximate 961,000 acres proposed to undergo chemical treatments, there would be an expected increase in erosion during the time of initial treatments. The increased erosion would occur for a short period, about two years.	On the approximate 1,489,000 acres of allotment specific grazing management there would be a sustained approximate average decrease in soil erosion by 20 percent from the present rates and soil productivity will be sustained at a higher level than at present.	Short duration increased erosion from vegetative treatments would be traded off for long-term decrease in soil erosion and an increase in soil productivity for the ES area.
Water Production and Quality	There would be some reduction (less than 1%) in localized run-off from additional ground cover (mainly litter). This ground cover would slow the rate at which the water flows, allowing it to enter the soil instead of running off the site. The slower rate of flow would cause less sediment (less than 1%) to be carried in the water, improving water quality. The decreased rate of flow would favor an increase in onsite recharge of ground water.	The short-term productivity would be maintained.	None.
Wildlife	Brush control would alter shrub habitat on 464,000 acres. Approximately 164 aquatic habitat areas (82 acres) within dirt tanks would continue to deteriorate. Thirty-two aquatic habitat areas within dirt tanks (16 acres) and seven protected playas (35 acres) would become productive. Seventeen broadleaf tree habitats (10 acres) would maintain themselves and expand with fencing. Ground-nesting birds would be subject to possible nest disturbance on 702,000 acres to 1,053,000 acres annually. Forage allocations to big game combined with livestock numbers adjustment and moderate forage utilization will bring big game habitats within carrying capacity. New waters in big game ranges would help stabilize populations, but would also result in moderate to heavy use of previously lightly-used areas. Fences (202 miles) would result in additional barriers to some wildlife.	Same as for short-term plus the following impacts. Brush control followed by specific grazing management would bring 566,400 acres of short and mid-grass habitats into prime condition for grassland wildlife. Brush-adapted wildlife would benefit from the improvement in ground cover in 70,000 acres of mixed desert shrub habitat. Animals found in the shinnery oak/bluestem habitat (lesser prairie chicken, mule deer, antelope) can expect range condition to range from fair to good on 517,000 acres.	Modification of 464,000 acres of brushy habitat would be traded off for the same acreage gained in improved grassland habitat.

TABLE 6-1
SHORT-TERM VERSUS LONG-TERM PRODUCTIVITY
(Source: Chapter 3)

2

Resource	Short-Term	Long-Term	Tradeoffs
Cultural Resources	Erosion is one of the most destructive forces which affects cultural site deterioration. Since soil loss increases of a short duration (approximately two years) would occur in the short-term, erosive loss of cultural resources would be accelerated. Concentrations of livestock would also accelerate site deterioration. Under specific weather conditions, herbicides would have a short duration effect on cultural resources.	Over the long-term, watershed conditions would be improved (see Soils and Water) contributing to the protection of cultural resources. Loss of cultural sites due to erosion would decrease, although loss due to livestock concentrations would continue, to a lesser degree. Over the long-term, the herbicides would have a negligible effect on the dating of sites.	Increased erosion over the short duration in the short-term and livestock concentrations would increase cultural site deterioration slightly. Increased erosion would be traded for grazing systems designed to improve the watershed conditions and decrease the rate of cultural site deterioration.
Visual Resources	There would be adverse contrast caused by surface disturbance associated with the construction of livestock facilities.	Improved visual quality.	Increased short-term adverse visual contrast would be traded off to achieve an overall improvement of the visual resources throughout the ES area.
Recreation	There would be a slight increase in hunting opportunities brought about by new water facilities. There would be a slight detrimental impact on ORV use brought about by additional fencing.	Impacts described in the short-term would continue in the long-term.	Projected demand for 42,844 visitor days in the year 2000 would probably be satisfied.
Livestock Grazing	The present 233,885 licensed livestock AUMs would be reduced on 154 allotments and would increase on 30 allotments. There would be 168,111 AUMs available to livestock after the adjustment. This would be a 65,774 AUM reduction from present licensed use. After eight years at the reduced AUM level, there would be a 526,000 AUM loss from what would be produced if the present AUM level continued in the eight-year period. After the eight-year period and before the year 2000, licensed livestock AUMs will increase to 366,885 AUMs, 133,000 AUMs over the present licensed AUMs. By the year 2000, the 526,000 cumulative AUMs lost in the first eight years will be made up by the year 2000,	366,885 licensed livestock AUMs would be available each year.	A reduction of 65,774 AUMs in the short-term for eight years will be traded off for 133,000 AUM increase during the long-term.
Economic Conditions	Between 1980 and 1984, 15 ranchers would need to obtain off-ranch jobs to supplement their income, 8 to 10 ranch workers would be laid off and 60 workers in other economic sectors would be displaced. Ranch operators would experience financial problems because their capital position would be reduced by over $8 million in 1984. Between 1984 and 1989, these jobs would be replaced as the livestock industry and associated sectors of the business community began to recover with increases in permitted grazing. The rancher wealth-capital position of the ES area would also be restored. Cumulative losses in livestock sales between 1980 and 1989 would amount to $3.4 million below the 1978 level. However, this trend would be reversed after 1989, and livestock sales and employment would exceed the 1978 level. Between 1989 and the year 2000, the total cumulative cash value of livestock sales in the ES area would increase by $7.1 million above the peak 1978 level for a cumulative gain of $3.7 million in livestock sales during the short-term (20 years) period.	Specific grazing management systems would maintain ranching in the area, both as an economic activity and a sociocultural community. Increased livestock grazing attained during the short-term and maintained in the long-term.	Short-run (8-10 years) economic set backs would be tradeoffs for long-term improvement in productivity.

CHAPTER 7

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Chapter 7

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

This chapter identifies the extent to which the proposed action would irreversibly curtail the potential uses of the land and resources. Used in this manner, the term "irreversible" is defined as "incapable of being reversed." Once initiated, use would continue. The term "irretrievable" means "irrecoverable; not reasonably retrievable; once used, it is not replaceable." No commitments have been identified for vegetation, water production, water quality, wildlife, visual, recreation, or livestock grazing resources.

Soil

Topsoil losses of approximately 1,037 acre feet, during the 20-year time period between 1980 and 2000, as a direct result of livestock grazing activities, vegetative treatments, and construction of facilities, would be irretrievable. In the time period following the year 2000, approximately 40 acre-feet of topsoil per year would be continue to be lost from the ES area.

Cultural Resources

Proposed livestock grazing could displace or alter certain cultural resources through trampling. Once disturbed, historical, archeological, or paleontological data become more difficult to recover and the full significance of these data could not be recovered. A data gap in the area's history would result. This is considered an irreversible impact. Increased access to the area could result in irreversible vandalism of sites.

Economic Conditions

The decreases in rancher's wealth-capital position and ranch incomes in the ES area during the short-run (9-year implementation period) would represent opportunity losses which would constitute irreversible and irretrievable commitment of resources. Losses in rancher's wealth-capital position, livestock sales, and net ranch cash incomes during the short-run would be restored and exceeded during the long-run (11-year range improvement period).

CHAPTER 8

ALTERNATIVES TO THE PROPOSED ACTION

CHAPTER 8

ALTERNATIVES TO THE PROPOSED ACTION

Chapter 8 discusses seven alternatives to the proposed action: 1. The proposed action, using alternative chemicals; 2. The proposed action, using mechanical control only; 3. No Action; 4. Livestock Forage Maximization; 5. Livestock Adjustment; 6. Enhancement of Other Resource Values; and 7. No Grazing. The basic assumptions and analysis guidelines used to assess the impacts of the proposed action (P. 3-1) were also used in the impact analysis for each of the seven alternatives. Tables 8-2, 8-3, 8-4 and 8-5 (the last few pages of this chapter), compare the proposed action and the seven alternatives to the existing environment.

THE PROPOSED ACTION, USING ALTERNATIVE CHEMICALS

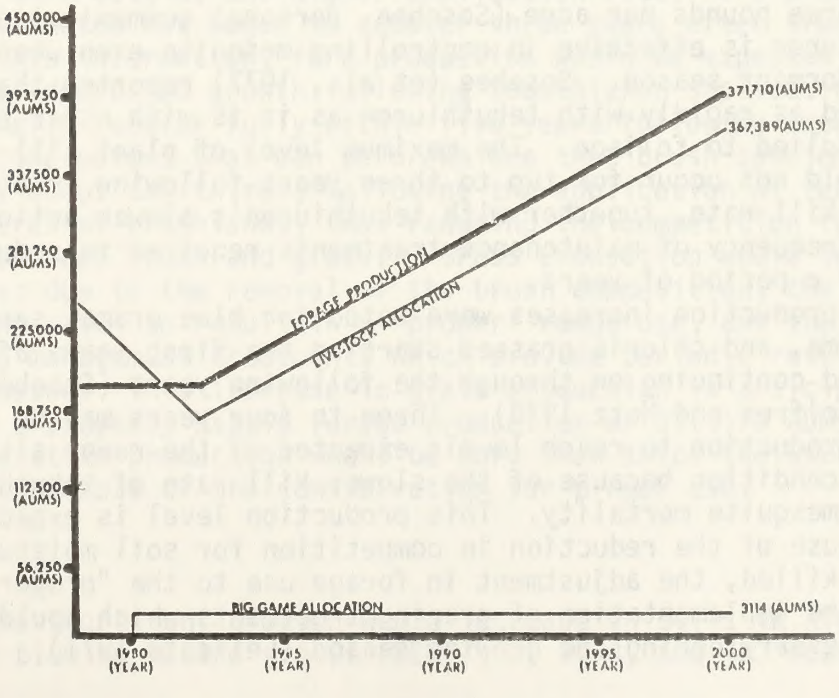
(Alternative 1)

This alternative allocates forage, adjusts livestock numbers, and proposes the development of grazing systems with associated livestock facilities exactly the same as the proposed action (see Tables 1-2, 1-3, 1-4, and 1-9). Graph 8-1 shows the initial and subsequent allocation of the properly usable forage.

GRAPH 8-1

ALLOCATION OF FORAGE OVER A 20 YEAR TIME PERIOD.

WITH THE PROPOSED ACTION USING ALTERNATIVE CHEMICALS



The only difference between this alternative and the proposed action is that it considers alternative chemicals which are expected to become available for rangeland use within the next one to two years. Substitutions of alternative chemicals would occur only after an environmental assessment had been completed, indicating that the alternative chemical was acceptable for use.

Tebuthiuron is a chemical which would most likely be substituted for picloram and dicamba. It is not presently registered or labeled for use but it has been extensively tested for rangeland application, and is expected to become available for use in the near future. For that reason, an analysis of this alternative deals specifically with tebuthiuron.

Tebuthiuron would be applied to 578,564 acres of deepsand, sandy, sandhills, loamy sand, and sandy plains range sites. Picloram and dicamba would still be applied to the remaining 382,800 acres of the total treatment area (961,364 acres).

Impact Analysis

This alternative would not affect any elements of the physical setting.

Vegetation

The use of tebuthiuron under this alternative rather than picloram or dicamba would yield the same forage production level for the ES area as the proposed action (371,710 AUMs). However, the kill rate for mesquite would be expected to be as high as 50 to 70 percent on sandy soils using tebuthiuron in a granular formulation (20 percent active ingredient) at two to three pounds per acre (Sosebee, personal communications 1978).

Tebuthiuron is effective in controlling mesquite even when applied during the dormant season. Sosebee (et al., 1977) reported that mesquite is not killed as rapidly with tebuthiuron as it is with other chemicals which are applied to foliage. The maximum level of plant kill (50 to 70 percent) would not occur for two to three years following treatment. This higher kill rate, together with tebuthiuron's slower action, would reduce the frequency of maintenance treatments required to reduce mesquite density over a period of years.

Forage production increases were noted for blue grama, sand dropseed, sideoats grama, and chloris grasses starting the first years after treatment and continuing on through the following years (Sosebee, et al., 1977; Scifres and Mutz 1978). Three to four years may be required for forage production to reach levels expected of the range site in "excellent" condition because of the slower kill rate of tebuthiuron and the delayed mesquite mortality. This production level is expected to be reached because of the reduction in competition for soil moisture as mesquite is killed, the adjustment in forage use to the "proper use" level, and the implementation of grazing treatments which would provide the rest necessary during the growing season (Leifeste 1971).

Tebuthiuron is expected to be more damaging to nontarget shrubs such as fourwing saltbush, littleleaf sumac, sand sage, and shinnery oak than either picloram or dicamba. Petit (1977) reported that tebuthiuron defoliated 73 to 92 percent of shinnery oak one year after treatment at a rate one quarter to one pound active ingredient per acre. A rate of two pounds per acre of the active ingredient was sufficient to kill 100 percent of blackjack oak in westcentral Oklahoma (Shroyer et al., 1979). For these reasons, it is believed that a treatment of two or three pounds per acre in the ES area would kill at least 70 to 80 percent of shinnery oak in the proposed treatment area. Shinnery oak grows on about 148,500 acres of the total 961,364 acres proposed for treatment. Reductions in shinnery oak would benefit grass production because this plant competes with grass for soil moisture. The effect of tebuthiuron on the other major nontarget brush species would be a reduction in density on about 14,850 acres of sand sagebrush, and 2,000 acres of fourwing saltbush. Littleleaf sumac is not widespread and could normally be avoided.

Baur (1978) noted that seedling growth of Johnsongrass and ryegrass was seriously reduced eight months after treatment when three pounds of tebuthiuron (active ingredient) were applied per acre. However, the use of one pound per acre did not inhibit growth. To insure that grass seedlings are not injured, it is essential that treated areas which have a poor stand of perennial grass and where seedlings are expected, receive a lower rate of tebuthiuron (1 to 2 lbs per acre).

Scifres and Mutz (1978) followed responses in forb production after applications of one and four pounds of tebuthiuron (active ingredient) per acre. Forb production decreased the first year after applying one pound per acre but, at the higher application rate, forb production was nearly eliminated but began to recover three years after treatment. Based on this information, forb production would be expected to undergo a period of depressed growth following tebuthiuron applications but would normally recover fully within five years following treatment.

The conclusions that can be drawn are that brush species would be reduced by about two-thirds, following the application of tebuthiuron to 578,564 acres of brushlands, thus reducing the competition for soil moisture between brush and grass. Grass production would increase on these areas due to the removal of the brush competition, the adjustment in stocking rates to result in a "proper" range use, and the application of grazing management treatments which provide periodic rest during the growing season. This increase in grass production is anticipated to result in a properly usable forage production of 371,170 AUMs. The total vegetative production would be more than twice the usable forage production because of the consideration for proper use.

Soils

In the short-run, erosion would increase on soils in high and very high soil blowing hazard groups (WEG 1, 2, 3, 4, and 4L) because sand dunes would tend to level out as mesquite is defoliated. Tebuthiuron would persist in the soil profile longer than either picloram or dicamba. The half-life of this herbicide in soils is 12 to 15 months in areas where there is 40 to 60 inches of rainfall (Spike for Broad Spectrum Vegetation Control, Elanco Products Company). Since the ES area has an average annual precipitation of 9.6 inches, the half-life is expected to be longer than 15 months.

Air Quality

Current estimates indicate that the concentration of tebuthiuron in the atmosphere would not exceed 5 percent and would be dissipated in 48 hours or less.

Water Quality

Once activated by rainfall, tebuthiuron is not mobile in the soil, and resists lateral movement away from the area to which it was applied. Tebuthiuron disappears mainly due to microbial degradation.

Since 95 percent of the ES area is in a closed basin (Chapter 2), no run-off is expected which would contaminate streams.

Wildlife

Aquatic Habitat

Under this alternative, 42 miles of live stream and 3,379 acres of riparian habitat would be involved in protective management. At least 82 acres of aquatic habitat at dirt tanks would continue to be in poor condition, if livestock access remains unrestricted. However, 16 acres of aquatic habitat at dirt tanks and 35 acres of playa habitat would benefit from the exclusion of livestock.

Terrestial Habitat

The major change which would result from the use of tebuthiuron as the alternative chemical would be an increase in the kill rate of both target and nontarget plants.

As shown in Chapter 3, the effects of brush removal would have both positive and negative effects. The conversion of 30,740 acres of shinnery oak habitat and of 15,000 acres of sandy mesquite range into grasslands would benefit common and endangered snakes, common and endangered grassland birds, all carnivores, ground squirrels, pocket mice, and antelope in the area treated initially. In the remaining areas, the conversion of approximately 748,000 acres of mesquite and shinnery oak habitat to grassland would benefit the same animals. A 70 to 80 percent kill of shinnery oak would not seriously affect lesser prairie chickens, since a 20 to 30 percent canopy of shinnery oak would still offer adequate brood habitat to young chicks and a winter food supply for adults.

A high kill rate on other nontarget shrubs (fourwinged saltbush, acacias, and littleleaf sumac) would adversely affect shrubland wildlife; however, wildlife values to be gained by allowing brush control in former grasslands outweigh the losses.

Toads, lizards, common and endangered shrubland birds, coyotes, jackrabbits, and mule deer would not benefit from heavy brush mortalities. Improved range conditions which would follow an increase in the grass cover would not favor toads, lizards, or jackrabbits. Coyote numbers would drop below one per square mile, then level off when alternate prey species become dominant. One hundred and eleven mule deer would be affected by the loss of shinnery oak on the initial treatment area and 174 mule deer would be affected on the remaining 148,000 acres planned for treatment. Without an adequate supply of mesquite beans or shinnery oak acorns, important components of their diet, mule deer would be displaced (Duvendeck 1961; Short 1977).

The use of herbicide spraying to reduce the percentage of shinnery oak on 8,000 acres of habitat in areas where brush control treatments are proposed would affect the range of the sandune sagebrush lizard (SEII). This would affect the sandune sagebrush lizard because active dune areas would be stabilized with grass and dune stabilization is the greatest threat to this lizard (Degenhardt and Sena 1976).

Other impacts, such as rest periods, forage allocations, utilization levels, exclusion areas, facilities, and burning, would have effects similar to those described in Chapter 3.

Summary and Conclusion

The use of tebuthiuron would reduce habitat for shrubland wildlife by 60 percent and increase grassland habitat by 500 percent. Although some mule deer may be displaced, no changes in big game population are to be expected.

Tebuthiuron has a low toxicity potential in all classes of animals tested. Effects on humans would also be negligible, when used at manufacturer's recommended rates (Table 8-1).

Threatened or Endangered Wildlife

There would be virtually no impact on threatened or endangered wildlife under this proposal.

Cultural Resources

Archeological sites would be trampled by livestock, resulting in breakage of artifacts. Additional access developed for installation of range facilities would open the area up for increased pot-hunting. Tebuthiuron would penetrate the soil profile and would persist there longer than dicamba or picloram would. The effect of this persistence on radiocarbon dating would be greater and of longer duration than would result from the use of dicamba or picloram.

TABLE 8-1
EFFECTS OF TEBUTHIURON ON ANIMALS: TOXIC LEVELS AND STUDY RESULTS
(Source: See Reference Column)

Chemical	Animal	Dosage	Effects	Conclusion of Study	Reference
Tebuthiuron	Mice, dog, duck, fish	Unspecified oral dosage	No accumulation in body tissues. Metabolic properties were excreted in the urine.	Toxicity is of low order.	Morton and Hoffman, 1976
Tebuthiuron	Mice	LD 50 = 579 mg/kg	Half the text population died.	Toxicity is of low order.	Todd, et al., 1974
	Rabbits	LD 50 = 286 mg/kg	Half the test population died.		
	Cats	200 mg/kg	No animals died.		
	Quail	500 mg/kg	No animals died.		
	Ducks	500 mg/kg	No animals died.		
	Dogs	500 mg/kg	No animals died.		
	Rats	3 month study, 2,500 ppm. dose given daily	Moderate growth retardation.		
	Dogs	3 month study, 50 mg. dose given daily	Slight weight loss.		
	Chickens	1 month study, 2,500 ppm. dose given daily	Suppressed weight gain.		
Tebuthiuron	Rats	LD 50 600 mg/kg	Half the test population died.	Toxicity is of low order	Eaton, et al., 1974
	Bluegill (fish)	TL 50 122 ppm.	Half the test population died.		

Visual Resources

The use of tebuthiuron or other similar chemicals would not result in a significant impact upon the visual aspect of the area. Other vegetation with similar growth forms would remain in the area.

Recreation

Because brush habitat would be reduced, and grassland habitat would be expanded, there would be an overall reduction in hunting opportunities and a shift from dove and quail opportunities to antelope hunting opportunities.

Wilderness

The visual aspect would change from domination by brush to domination by grass. Since those brush species to be controlled are invaders in southeastern New Mexico, the wilderness characteristics, if they exist, would not be adversely affected.

Livestock Grazing

Tebuthiuron would be expected to give similar if not better kill rates on some brush species than would either dicamba or picloram (see Vegetation, Chapter 3). In the long-run, livestock forage production would be expected to total 367,442 AUMs on all three management classes, existing allotment management plans (AMP), and proposals for both "specific management" and "no specific grazing management" allotments. Tebuthiuron persists longer than dicamba or picloram, but it would not be toxic to livestock.

Economic Conditions

Initial reductions in livestock numbers would result in a short-run decline in livestock sales of $1.5 million and a decrease of approximately $1.1 million in net cash income. During the long-run, as the result of range improvement and increases in forage being available for livestock grazing, sales would increase by $1.4 million above the 1978 level and net cash income would rise by approximately $943,179. Overall, there would be an improvement in economic conditions.

Social Conditions

The opportunities for rural lifestyles would be depressed in the short-run and enhanced in the long-run.

Mitigating Measures

The BLM is not committed to any new mitigating measures to reduce the impacts of this alternative. Such measures proposed as a part of the proposed action would mitigate the impacts resulting from this alternative.

THE PROPOSED ACTION, USING MECHANICAL BRUSH CONTROL ONLY

(Alternative 2)

This alternative is the same as for the proposed action, with the exception of the methods which would be used to control brush, i.e.: mechanical grubbing. Tractor-mounted root knives would be used to uproot individual brush plants (either mesquite or creosote) on a total of 263,056 acres. Appendix 4, Table D-1 indicates acreages, by range site, which would be treated in each allotment, together with the potential production of forage in animal unit months (AUMs) of forage which could be expected to be added.

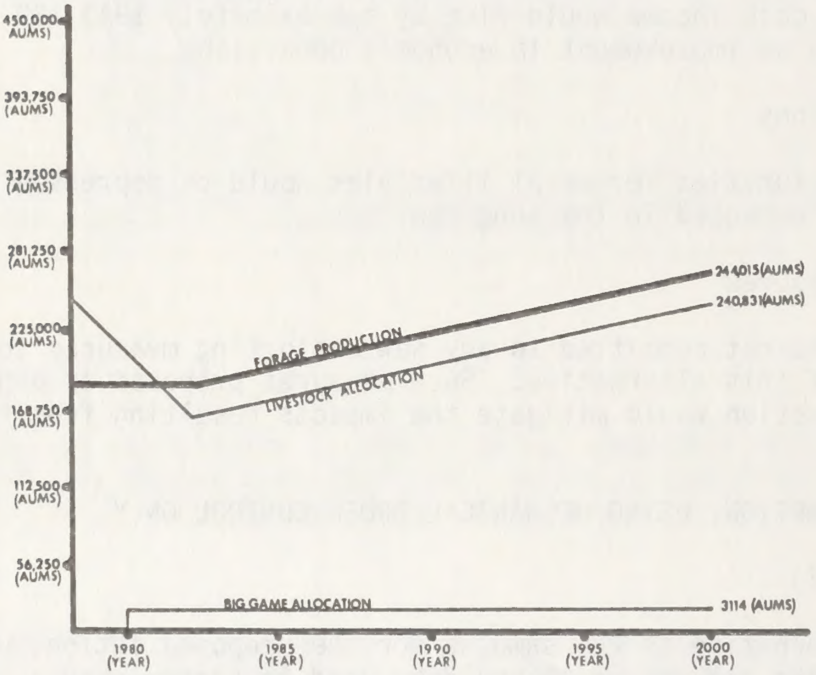
Range sites suitable for mechanical treatment include sandy, salty bottomland, bottomland, loamy, and salt flats that have been invaded with mesquite or creosote. Range sites chosen for this treatment were selected by BLM soil scientists using SCS soil surveys. The reason these range sites were selected was because of their classification as having a slight to moderate erosion hazard and because soil depths are greater than 20 inches.

Livestock stocking would be adjusted initially in the same manner as the proposed action but subsequent adjustments would be less. The reason for this lower amount of adjustment is because fewer acres would receive brush control treatment (see Graph 8-2 for forage production and allocation of forage under this alternative). Livestock adjustments upward would not be made until the forage production increases were demonstrated through actual use and utilization studies.

GRAPH 8-2

ALLOCATION OF FORAGE OVER A 20 YEAR TIME PERIOD

WITH THE PROPOSED ACTION USING MECHANICAL CONTROL ONLY



Impact Analysis

This alternative would not affect any components of the physical setting, air quality, water production, or water quality.

Vegetation

Mechanical control would be expected to kill 80 to 95 percent of all mesquite and creosote on this acreage. However, a 5 to 20 percent regrowth rate would be possible because of plants which are too small to be seen by the operator. Little or no maintenance would be necessary because of the high percentage of brush being killed.

Following grubbing, the response of herbage depends on rainfall and the density and composition of those grasses which were already growing in open areas between mesquite canopies. Because grubbing kills most plants growing beneath these canopies, recovery of forage on areas which are in poor condition may be seriously reduced immediately following treatment. After grubbing, Brock (1978) found that production of forage plants required two years to reach pretreatment levels. This reduced production could last three to five years in the ES area because the rainfall average is 40 percent less than Brock's study area.

Existing production in the ES area is 175,167 AUMs. Use of the mechanical brush control alternative, together with adjusted stocking rates and rest treatments, would potentially increase this production level to 244,015 AUMs.

Areas which are moderately to heavily infested with brush but which would not be treated, would not improve in condition even with the implementation of grazing treatments. Shinnery oak, mesquite, and creosote would continue to increase where they are established. Increases in brush cover would not be retarded on rangeland which is in poor or fair condition, (See Vegetation in Chapter 3).

Mechanical treatments to remove brush would not be necessary on grassland areas. Under the grazing treatments proposed, grasslands would be expected to improve to "excellent" production levels and forage plants would be allowed to maintain both high vigor and high reproduction rates.

On the other hand, there is a potential risk of damage to vegetative cover in the long-run from mechanical grubbing. If drought conditions were to begin following grubbing, vegetative cover within the former mesquite canopy zone would not recover. Moisture also aids in extracting the crown of target plants, eliminating the chance for bud resprouting and also helps grass to recover.

Summary and Conclusion

Forage production would increase under this proposal in much the same manner as for the proposed action, with the primary difference being in degree. Mechanical removal of mesquite would be used on only 263,056 acres as opposed to 961,364 acres under the proposed action. This removal of mesquite to reduce the competition for soil moisture would allow forage on those acres to improve in condition and production. The adjustment of livestock stocking to the proper use level "moderate" along with the development of grazing systems that provide spring and summer rest would enhance this vegetative response favoring climax forage producing species. Changes from the existing 175,167 AUMs to 244,015 AUMs would be expected within the 20-year long-run period. Areas which do not undergo treatments to control brush are not expected to respond by changing forage production or condition because competition for soil moisture would still be present. Plant vigor would improve for nearly all forage plants as grazing pressures are reduced. However, this would not translate into an appreciable increase in forage production.

In conclusion, there would be an overall increase of 68,848 AUMs in forage production on the 263,056 acres to be treated together with maintenance of forage production on the remaining 1,327,078 acres, which would produce a total of 244,015 AUMs of properly usable forage.

Threatened or Endangered Plants

Other than herbage growing in the canopy zone, nontarget species would not be affected by mechanical grubbing. Those forbs proposed to the Federal Threatened Species List would not be impacted by this method of brush control. All grubbing could be site-specific and off-site damage would be minimal.

Soils

Mechanical removal of brush on 263,056 acres would be expected to severely disturb the soil surface initially but vegetation would be expected to be reestablished within two growing seasons. Of the proposed treatment area, approximately 229,050 acres are rated as being in areas where the soil blowing hazard is rated as very high and high. Soils in these areas could initially be expected to erode severely because of surface disturbances but this erosion would be of short duration (2 years), ending as vegetation is reestablished. Approximately 34,000 of those acres to be treated are in areas where the hazard of soil blowing is moderate. When disturbed, these areas are expected to undergo moderate rates of erosion but, again, such erosion would be of short duration (2 years). On the total of 263,056 acres, erosion is expected to be of short duration (2 years) and vegetation is expected to become reestablished within two growing seasons. In the long-run (20 years), soil productivity and vegetative ground cover would be expected to increase, decreasing overall soil erosion. The vegetation section of this chapter presents a discussion of vegetative responses to mechanical brush control.

In conclusion, soil productivity would increase while erosion would decrease by approximately 228 acre-feet per year.

Wildlife

Aquatic Habitat

Under this alternative, 42 miles of live stream and 3,379 acres of riparian habitat would be involved in protective management. At least 82 acres of aquatic habitat at dirt tanks would remain in poor condition, if livestock access remains unrestricted. However, 16 acres of aquatic habitat at dirt tanks and 35 acres of playa habitat would benefit from the exclusion of livestock.

Terrestial Habitat

The use of mechanical means to control brush would change the size of the area to be treated and would be more effective than would be expected if chemicals were used. Conversion of 263,056 acres to grasslands would benefit the common and endangered snakes, common and endangered grassland birds, carnivores, ground squirrels, mice, and antelope. An immediate animal response to the mechanical control of brush would not be expected since grass production could be depressed for three to five years following treatment (see Vegetation). A flush of forb growth could take place in the year following these treatments. This growth would benefit rodents and antelope. Brush-infested acreage which is converted to grasslands would be lost as habitat for shrub-adapted wildlife. This loss would affect those common and endangered shrubland birds which are particularly dependent on mesquite, as well as small mammals, lizards, and toads. Although the average acreage on each allotment to be treated is small (1,260 acres), removal of brush would affect these less-mobile animals seriously. Coyotes, bobcats, and mule deer would not be as seriously impacted since their mobility would allow them to move to areas that are more secure. Additionally, fourwing saltbush, littleleaf sumac, crucifixion-thorn, and other mixed desert shrubs offering food and cover for these species would not be disturbed. Initiation of grubbing during August and September and adherence to 300-yard buffer zones would have minimal impacts on nesting Swainson's hawks (BL) and Harris' hawks (BL) since peak incubation periods are mid-June through mid-July.

Other impacts, such as rest periods, forage allocations, utilization levels, exclusion areas, facilities, and burning, would exert effects similar to those previously mentioned in Chapter 3.

Summary and Conclusion

Brush control would adversely affect lizards, small mammals, and some species of birds on 263,056 acres. No other significant adverse impacts would be expected. Most other species would either be unaffected or would benefit by the implementation of this proposal.

Cultural Resources

Under this alternative, archeological sites would continue to be trampled by livestock, resulting in breakage of artifacts. Additional access developed for installation of range facilities would open the area for increased pothunting.

In addition, there would be some adverse effects on cultural resources caused by large-scale mechanical removal of brush. One of the standard operating procedures is the avoidance of cultural resources. Flagging would be used to define those areas to be avoided because of cultural resources. However, this method of avoidance poses some problems.

For example, the Forest Service found that areas flagged for avoidance were easily missed by the operators during the chaining of juniper. In addition, islands of trees which were left in order to avoid a site advertised the presence of that site (DeBloos, et al., not dated).

Similarly, the flagging used to denote areas to be avoided could easily be missed during grubbing operations and any islands of brush which were left could become identified by potential pothunters as site locations.

The cost of contracting Class III archeological surveys would probably average $6 per acre, totalling approximately $1,578,000 for the approximate 263,000 acres involved in the mechanical removal of brush.

In conclusion, this alternative could result in loss or damage to archeological sites through increased vandalism.

Visual Resources

In Class II areas, approximately 8,000 acres of mechanical brush control (grubbing) would be done. Because the plants would be uprooted, some soil disturbance would result. The uprooted portions of the plants would extend two to three feet above the ground and would be visible for many years to come. However, grasses and forbs would revegetate disturbed soils in two to three years. The end result would be a contrast rating less than ten, which is the maximum allowable for Class II areas. Approximately 18,000 acres would be grubbed in Class III areas and the remaining 237,000 would be done in Class IV areas. The contrast ratings would be far below the 16 and 20 allowable ratings for these classes.

In conclusion, this alternative would have virtually no effect on visual resources.

Recreation

No impact would occur except that fewer acres of brush would be controlled, therefore, hunting opportunities would be similar to those now existing.

Wilderness

Of the 263,056 acres of public land to be treated under this alternative, none are within or near the ES area's Instant Wilderness Study Area or intensive inventory unit.

Immediately following treatment, soil disturbances caused by the control work would be evident. Within a few years, surface disturbances would be less evident because of revegetation. However, the uprooted portions of the plants would be visible for many years. Because wilderness review and study are mandated by Section 603 of the Federal Land Policy and Management Act (FLPMA) and because this Act mandates that, during review and study, the public lands shall be managed so as not to impair their suitability for preservation as wilderness, mechanical removal of brush would not be allowed unless such removal could be accomplished in a manner consistent with the interim management policy and guidelines for Wilderness Study Areas.

Livestock Grazing

The mechanical control of brush species would have no adverse effects on livestock, however, the total number of acres treated would be small as a result of suitability for mechanical control. This would, in turn, increase the potential production by 6,946 AUMs above the present production. This alternative would not affect the 74 allotments with "no specific management" proposed because brush control programs would not take place.

Economic Conditions

Livestock sales from ranches in the ES area would decline by $606,950 a year by the end of the century with this alternative. Sales of $5.1 million in the year 2000 would be 10.3 percent less than estimated 1978 sales of approximately $5.9 million. At the same time, net cash income to ranchers would be diminished, with ranch income falling by $402,348 annually. This drop would cut ranchers' earnings from their operations by 11.7 percent, from an aggregate of $3.4 million to less than $3.1 million. Because of this decline, 15-20 ranch operators would be required to obtain off-ranch employment; to the extent that these ranchers were unwilling to subsidize ranch operations with outside income, they might curtail or cease ranch operations. Some ranchers would be faced with severe long-term financial difficulties, because allotment cuts would diminish rancher's wealth-capital position, and their ability to borrow capital would decline by an aggregate of $1.4 million. With the concurrent drop in ranch income and ability to borrow, defaults on outstanding loans would be made more likely. In the long-run, 10 to 20 ranches would be abandoned as commercial ventures, either being sold or being maintained as part-time, "hobby" operations.

Mitigating Measures

The BLM is not committed to any mitigating measures to lessen or diminish the impacts identified, other than those included in standard operating procedures, design features, and those proposed for the proposed action in Chapter 4. Therefore, all impacts would be unavoidable.

NO ACTION

(Alternative 3)

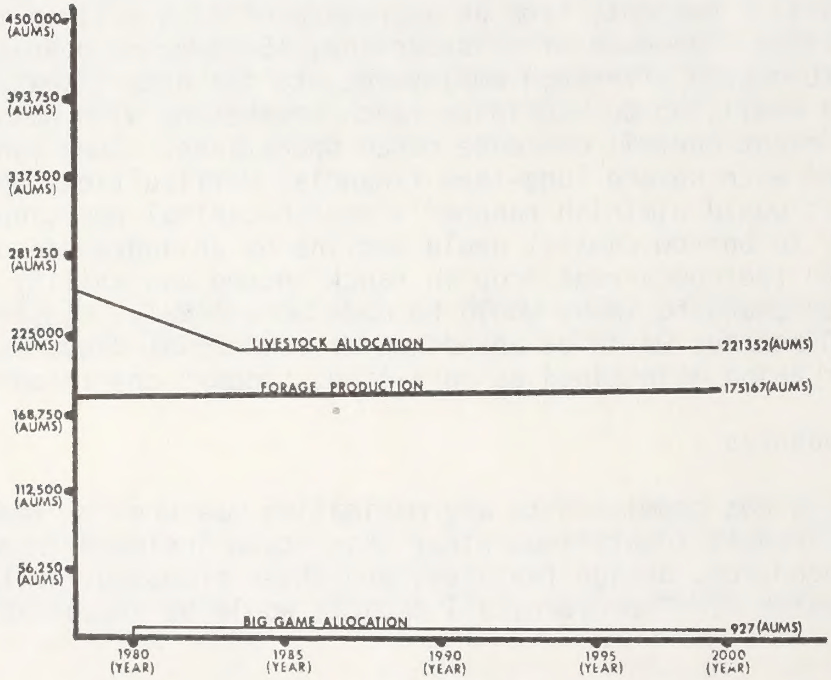
Under this alternative, livestock numbers would not be adjusted, except on the 20 existing allotment management plans (AMPs). These AMPs would continue to be maintained. No new "specific grazing management" systems would be developed and no additional livestock facilities would be either constructed or permitted on the remaining allotments. Vegetation on the public lands would not be treated to control brush.

The allocation of forage between livestock and wildlife is shown on Graph 8-3. It also indicates the adjustment in stocking rates that would take place, so that proper use of the vegetative resource would occur. Upward adjustments in livestock use would occur only after actual use and utilization studies demonstrate that the anticipated forage production is actually there.

GRAPH 8-3

ALLOCATION OF FORAGE OVER A 20 YEAR TIME PERIOD

WITH THE NO ACTION ALTERNATIVE



Impact Analysis

This alternative would not affect any components of the physical setting or air quality.

Vegetation

Without mesquite control measures, desirable vegetation would either remain static or deteriorate, depending on the grazing management employed, and the rate of further brush invasions. Improvements in forage production would not be expected.

Areas With Existing AMPs

Allotments presently having "specific grazing management" and livestock adjustments would allow improvement in forage plant production on brush-free areas (i.e., grasslands). These grasslands would improve to reach production potentials equal to SCS's data for each respective range site. This level of production has been achieved on portions of allotments numbers 6038, 5057, and 5037. Projected AUM increases on grasslands are provided for existing AMPs in Appendix 1, Table A-8.

Vegetative ground cover (litter and live vegetation), on the grassland areas, is expected to increase by 15 to 25 percent through increased vigor, production, and proper use. Transects used to measure total watershed cover recorded similar improvement on areas where brush has been controlled as they become restored to the production level of "excellent condition" grasslands (data in Appendix 3, Table C-2). Increases in herbacious vegetative cover would also retard reinvasion of brush plants onto grassland areas (see Chapter 3: Vegetation).

Areas infested by brush (e.g., shinnery oak, creosote, and mesquite) would not significantly improve in range condition under this alternative. Grazing rest treatments on such areas would serve to prevent further range deterioration, but the existing production levels would be expected to continue. Some continuation of range deterioration is expected on brush-infested areas where past grazing has removed the grass cover. Such areas of bare ground are more susceptible to further brush invasion than are areas with good grass cover (Glendening and Paulsen 1955; Scifres 1971). Overall, little change from the existing forage production of 64,317 AUMs is expected on these 582,956 acres of public lands.

Areas Without AMPs

Vigor and reproductive capabilities would continue to be depressed on palatable shrubs and grasses such as fourwing saltbush, black grama, bush muhly, plains bristlegrass, and bluestems. Brush competition with herbage plants for soil water would continue, but overall range condition and production is not expected to deteriorate below their present depressed level of 110,854 AUMs, even though authorized livestock use would remain at 159,233 AUMs. The reason for this is primarily because the forage presently being produced is coming from plants which are more resistant to grazing and are of lower quality than the plants which would dominate the site when it was in excellent condition.

Exclusion Areas

New exclusion areas would not be established on public land. Vegetative data comparing effects of grazing programs would not be available from the exclosures within the proposed action.

Summary and Conclusion

Improvements in range condition and forage production are not expected on most of the ES area because of the lack of treatments to control brush. Some improvement of grassland areas would occur on existing AMP areas.

Threatened or Endangered Plants

Because of their low palatability, forbs proposed for inclusion on the Federal List of Threatened Species would not be jeopardized under this alternative.

Soils

Under the No Action alternative, the AMP area's vegetative cover is expected to increase by 20 percent and the desired 60 percent level of ground cover (litter and live vegetation) would be established. Improved ground cover would decrease soil erosion (See Appendix 2, Table B-5, for erosion rates).

Forage production on the "nonallotment management plan" areas would continue at approximately the present level. The amount of vegetative ground cover would remain as it is at present. The soil series and their corresponding range sites would continue to erode from wind and water at those rates as listed in Appendix 2, Table B-4. This table shows the estimated erosion rates for range sites at the present and for the future after the proposed action. With the No Action alternative, the highest erosion rates listed for range sites are 1.25 and 1.23 AF/sq.mi./yr. while the lowest rates are .31 and .35 AF/sq.mi./yr.

Table B-5 also shows sediment yield rates at the present and what is expected by the year 2000 with "specific grazing management". An example is the Alama series which would have .56 AF/sq.mi./yr. of sediment yield at the present. Implementation of grazing management would reduce this to .40 AF/sq.mi./yr. sediment yield by the year 2000.

In conclusion, soil productivity and erosion rates would not change from the present situation on the areas where "no specific grazing management" is proposed (1,007,178 acres) but would improve on the areas where grazing management would be maintained (582,956 acres).

Water Production

By the year 2000, water consumption would increase by 35,800 acre-feet due to increased minerals activity. The use of water by livestock and wildlife can be expected to remain at or near present levels. Oil and gas drilling, as well as production, will continue to use more water each year. However, this increase is not expected to interfere with the small amounts necessary for livestock and wildlife.

Average annual water yields are not expected to change by the year 2000, since they are primarily controlled by climate and geology. However, an increase in ground cover on existing AMP areas (582,956 acres) should improve site conditions and reduce localized run-off conditions, favoring ground water recharge. A slight increase in water run-off would result from a decrease in vegetative cover on non-AMP areas. This increase would not be greater than one percent. Overall water production would not change as a result of this proposal.

Water Quality

The chemical quality of both ground and surface water would generally remain at present levels. A slight increase in dissolved solids would be expected in run-off from non-AMP areas.

Wildlife

Aquatic Habitat

Under the No Action alternative, aquatic habitat along the Pecos River and seven upland playas which are seasonally wet, would continue to be grazed. With access to wadeable pools and riffles, livestock would destroy or disturb breeding and feeding areas of fish such as the roundnose minnow (SEI), silverband shiner (SEI), and the greenthroat darter (SEII). Grazing would not permit aquatic vegetation along the river's edge to become established, affecting foraging habitat for Pecos western ribbon snakes (SEII) and blotched plainbellied water snakes (SEII). Continued use of upland playas by livestock would inhibit growth of aquatic emergent plants which are important to waterfowl, shorebirds, songbirds, foraging carnivores and antelope. Complete livestock access would be available to 196 dirt tanks, which would remove them as potential aquatic habitat.

Terrestrial Habitat

Under the No Action alternative, the greatest changes would be through maintenance of "specific grazing management" systems on 20 existing AMPs. However, without brush control operations, only initial, temporary improvements in plant vigor and seed production would be expected to occur on 582,956 acres. This change would benefit snakes, birds, most small mammals, carnivores, antelope, and mule deer. Allocation of forage (945 AUMs for antelope and 1,259 AUMs for mule deer), moderate use of forage, adjustment of livestock numbers, and the existence of annual rest periods would benefit the ES area's herbivores in particular. Although 188,350 acres of antelope habitat would temporarily improve with the grazing systems, an increase in antelope numbers cannot be predicted due to other limiting factors such as continued invasion of brush. Increased availability of water, allocation of forage, and an adjustment of livestock numbers which would reduce competition, can be expected to increase the mule deer population by about 35 animals, however, brush invasion into remaining grassland areas would increase mule deer populations by 200 animals.

Periodic rest for pastures would both benefit and harm ground-nesting birds. Under a 16-month rest treatment, 145,000 acres (25 percent of AMP lands) would be rested yearly through two nesting seasons. Two-year rest cycles would achieve the same protection for nesting birds but would be used on 290,000 acres (50 percent of the AMP areas). As can be seen, large areas would still be subject to nest disturbance.

The 16-month rest treatment would be the minimum necessary to meet the requirements of antelope for forbs as a part of their diet. Under this cycle, 121,600 acres would be rested annually in occupied antelope range (486,500 acres). Mule deer would benefit from periodic rest on 406,200 acres of their range, particularly where fourwing saltbush grows (approximately 22,000 acres).

On that portion of the ES area where "specific grazing management" systems do not exist, 824,000 acres of wildlife habitat would continue towards development of a brush-dominated landscape with yearlong grazing by cattle continuing (Wiens and Dyer 1975). In the long-run, the only areas free of brush, i.e.: existing shortgrass habitat (88,400 acres), would succumb to invasions of mesquite without the implementation of systems to control brush or of grazing systems which are designed to meet the physiological needs of plants. See Table 8-4 (at the end of this chapter) for specific acres of habitat by animal impacted by this alternative.

Summary and Conclusion

All aquatic habitat and grassland habitat would continue to deteriorate with continued livestock use and advancing brush invasion. Antelope would eventually disappear while mule deer numbers would increase by 200 animals.

Cultural Resources

The trend in the condition of cultural resources is expected to be that of continued deterioration from erosion. Erosion would continue at the present rate within the area, affecting the horizontal and vertical placement of artifacts.

Visual Resources

The scenic quality of lands within the ES area which are being overgrazed, would be subject to the present rate of deterioration under this alternative. Areas which are presently rated as Visual Resource Management (VRM) Classes III and IV, which are borderline in each class, could be reduced to the next lower class. For example, if a Class III area with B quality scenery is degraded to C quality scenery, the area would consequently be lowered to Class IV values. This existing impact on overgrazed areas would not be modified by the elimination of vegetative treatments or construction of livestock facilities. Continued grazing at present levels would perpetuate or accelerate the present rate of scenic quality degradation.

Recreation

Because 42,692 acres of desert shrub would not undergo chemical treatments to remove shrubs, dove and quail habitat on those acres would remain and would provide for a continuation of present quality hunting experiences for sportsmen seeking those species.

Livestock Grazing

There would be no impact on 164 allotments which are not part of an allotment management plan (AMP). There would be an adjustment of livestock use on the 20 existing AMPs to levels set by the 1977-78 range survey. Proposed livestock facilities would be installed on the 20 existing AMPs. The 164 allotments would allow 159,233 animal unit months (AUMs) of use for livestock. The 20 AMP allotments would allow 62,119 AUMs. Total forage use under this alternative would be 221,352 AUMs, a decrease of 12,533 AUMs from the existing licensed use.

Social Conditions

Present demographic and economic trends would continue in the absence of the proposed action. Significant population increases are projected for Chaves, Eddy, and Lea Counties, with the total number of inhabitants rising to 157,150 in 1980, a rise of 4.9 percent from 1978 figures. By the year 2000, the population of southeastern New Mexico is projected to exceed 238,000, an increase of nearly 60 percent (University of New Mexico, 1976). The ES area would also experience population growth, expecially in Lea County. The numbers of inhabitants of the ES area would rise to nearly 64,000 in 1980 and more than 98,000 by the year 2000. Increases in population would be concentrated in existing urban areas, with the greatest gains occurring in Hobbs and its vicinity. Although population densities would increase, unincorporated areas of southeastern New Mexico would remain sparsely settled.

Economic Conditions

Regional employment and income would also rise to the year 2000, with a total of more than 125,000 workers employed and $1.6 billion in total personal income (University of New Mexico, 1976). The number of jobs in agriculture, and ranching in particular, would continue to decline while the projected growth of other industries would diminish the relative contribution of agriculture and ranching to regional income. By 2000, ranching would represent less than 2 percent of both employment and income. Rising costs of energy, feed, labor, and materials would diminish the already low returns to ranch operators. The numbers of ranchers relying on nonranching sources of income would climb toward 80 percent, while more operators would relocate from ranches to cities and towns near part-time or full-time jobs. The average age of ranchers would rise above 55 years because of the continued migration of young adults from ranches. The overall result of the no action alternative on the ranching community would be the situation where ranch incomes and sales would remain at approximately the 1978 levels. As other economic sectors increase, ranching would diminish to less than 2 percent of the total area's employment and income.

Mitigating Measures

Except for the standard operating procedures and design features outlined in the proposed action, the BLM is not committed to any mitigating measures to lessen or diminish the impacts of this alternative. Therefore, all impacts would be unavoidable.

LIVESTOCK FORAGE MAXIMIZATION

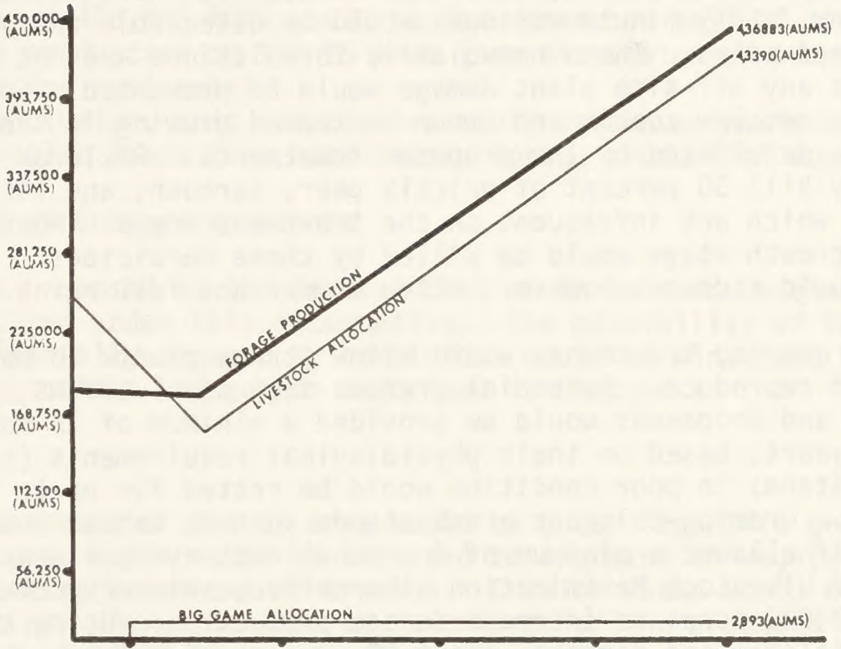
(Alternative 4)

This alternative would provide for the development of "allotment-specific grazing management" treatments on all 184 grazing allotments to achieve an optimum forage production for livestock on a sustained basis. This would involve vegetative treatments on 1,435,284 acres to convert brush-invaded rangelands to the original grasslands types, the construction of range improvements as shown on Table 1-9 in Chapter 1 and the development of specific grazing systems which provide spring and summer rest as described in Chapter 1. All forage production, present and future, would be allocated between livestock and big game as indicated on Graph 8-4. There would be no livestock exclusion areas constructed or maintained, and the entire area would be closed to off-road vehicles, except for administrative purposes. Standards and specifications for treatment and construction projects would be the same as described under the proposed action (Chapter 1). Upward adjustments in livestock allocation would not take place until actual use and utilization studies indicate that forage production is there to provide for additional use without damage.

GRAPH 8-4

ALLOCATION OF FORAGE OVER A 20 YEAR TIME PERIOD

WITH THE LIVESTOCK MAXIMIZATION ALTERNATIVE



Impact Analysis

Under this alternative, impacts resulting from the development of grazing systems and the proposed projects would be the same as described under the proposed action (a full discussion of impacts resulting from these sources is in Chapter 3). This section is intended to provide a discussion of impacts resulting from vegetative treatments which would exceed those of the proposal. This discussion should be used in addition to Chapter 3 for a complete analysis.

Vegetation

Under this alternative, control of brush infestations would result in an increase in the forage production on a total of 1,435,284 acres. As described in Chapter 3 (Chemical Brush Control-Vegetation), herbicides would kill 40 percent of the mesquite on 51,800 acres of the area proposed for initial treatment using an aerial application of a mixture of picloram and dicamba (1/4 lb. each/acre). In addition, individual mesquite treatment with dicamba on an initial 2,120 acres would kill 40 percent of those mesquite plants. An aerial application of picloram granules 1 lb./acre would be expected to eliminate 50 percent of the creosote on 360 acres.

As described in Chapter 3, these herbicides are short-lived in the range ecosystem. Only minute residues would be detectable one year later on treated sites. These nonvolatile formulations are not likely to drift, thus any off-site plant damage would be prevented. Some plants such as catclaw acacia and broom snakeweed growing in treated areas would be defoliated by the proposed treatments. Picloram granules would probably kill 50 percent of prickly pear, tarbush, and littleleaf sumac, all of which are infrequent on the treatment areas. Most forbs in an active growth stage would be killed by these herbicides. Forb production should recover, however, after summer and fall rains are received.

Proposed grazing treatments would allow forage plants to maintain good vigor and reproduce. Perennial grasses such as bluestems, gramas, bristlegrass, and dropseeds would be provided a minimum of 16 months' rest every 4 years, based on their physiological requirements (see Chapter 1). Stands in poor condition would be rested for up to 2 years, every 4 years. Grazing-tolerant grass stands such as tobosa and sacaton would thrive if allowed a minimum of 4 months' rest every 4 years.

Under the Livestock Maximization alternative, shinnery oak would be treated on 433,920 acres to increase forage production. Using a spray composed of picloram and dicamba, about 90 percent of shinnery oak would be defoliated but there would be only a 10 to 20 percent mortality. The resistance of shinnery oak to these herbicides would require that this shrub be treated every 3 to 5 years. Forage plant production would reach the "excellent" production levels within 5 to 7 years. The frequency of chemical treatment would reduce forb production by 50 percent (BLM assumption). Browse plants, broadleaf tree groves, playas, and riparian areas would show improved vigor under the 16-month, 20-month, and 2-year rest intervals. Controlled burning would be conducted on 520 acres of sacaton and tobosa as described in Chapter 3. Improved plant diversity and palatability would be realized.

Mechanical grubbing would remove 80 to 95 percent of the mesquite on two allotments (a total of 440 acres). Recovery of forage resources would require 3 to 5 years longer than would be required for chemical treatments because of the damage that the use of mechanical equipment would inflict on growing plants.

Vegetative ground cover (litter and live vegetation) would increase 20 to 30 percent on areas where brush has been controlled and grazing treatments have been implemented (data on Appendix 1, Table A-8).

No new livestock exclusion areas would be constructed under this alternative and existing exclusion areas would be removed. With the removal of exclosures, data concerning the effects of grazing versus no grazing would not be available for comparative research.

Summary and Conclusion

With this alternative, forage plant composition and vigor would improve through brush control treatments that would reduce the competition for soil moisture between brush and forage plants. This improvement would result in an anticipated forage production increase of 261,716 over the present production of 175,167 AUMs. The resulting total forage production of 436,883 AUMs would be less than one half of the total vegetative production on the ES area (see discussion on proper use in Appendix 1 for rationale).

In conclusion, this alternative would return approximately 1,435,284 acres of public lands to a near climax forage production condition.

Threatened or Endangered Plants

Forbs proposed to the Federal List of Threatened Species would not be jeopardized under this alternative. The possibility of these plants being accidentally damaged by herbicides would be minimized by the strict application safeguards described in Chapter 1.

Soils

Because most of the ES area would be under "specific grazing management" systems, soils would be expected to increase in vegetative cover, thus decreasing in amount of erosion. Erosion rates would equal 809 acre- feet per year, the same as described for the proposed action (Appendix 2, Table B-5).

On approximately 1.4 million acres which would undergo vegetative treatments, a short-term increase in soil erosion would result until vegetative cover is reestablished.

Construction of approximately 246 watering sites and 208 miles of fence would have a localized impact on approximately 175 acres within the ES area. There would be a loss of vegetation around watering sites because of livestock concentrations. Their trampling and the effects of construction would increase soil erosion. Establishment of the fences would be expected to have a short-run impact on the area's soils, with most of this disturbance occurring during actual construction. This disturbance would be caused by vehicular traffic along the lines of construction. Exact quantities of soil lost through erosion would be difficult to quantify, but would be insignificant in relation to the total acreage of the ES area. Erosion rates would return to present levels or improve as vegetation becomes reestablished within two growing seasons.

Water Production

The withdrawal of ground water would increase by approximately 173 acre-feet over the present use of 275 acre-feet per year. This increased level of use would be anticipated to continue for as long as this alternative was followed.

Water Quality

A reduction in localized run-off, less than 1 percent, with an associated reduction in total dissolved solids, also less than 1 percent, would occur as a result of improved watershed cover (see Vegetation in this chapter).

Wildlife

Aquatic Habitat

Without the benefits of protective management furnished by exclosures, wetland and riparian habitat would respond negatively to continued livestock access.

Terrestrial Habitat

In the long-run, control of brush and implementation of specific grazing management on approximately 1.4 million acres of land would convert 620,600 acres of mesquite range into a mosaic of short and midgrass habitat. This change would benefit snakes, common and classified grassland birds, small mammals, kit foxes, badgers, and antelope. Brush-adapted wildlife would lose the same amount of habitat. Toads, lizards, common and classified shrubland birds, jackrabbits, kangaroo rats, coyotes, and bobcats would decline as grasslands increased with the removal of brush. Nearly all of the 620,600 acres of brushland which would become grassland habitat is marginal range for mule deer. Effects on this animal would not be serious in these areas.

The remaining 370,400 acres which are expected to undergo chemical treatments to control brush are a mixture of shinnery oak/mesquite, mixed desert shrub, and creosote habitat. Under this alternative, shinnery oak would be a target species. Retreatment of shinnery oak areas would result in a 10 to 20 percent kill every three to five years. Bluestem communities would increase as shinnery oak densities decreased. Improvements in grass cover would benefit bull snakes, Baird's sparrows (SEII), Mexican ground squirrels, and kit foxes. Mule deer would decrease with the loss of browse and shinnery oak acorns on 140,000 acres. Losses in forb production during treatments would affect antelope. Picloram and dicamba would not harm mixed desert shrub plants other than mesquite. Creosote areas are primarily on rockier sites where the potential for these areas returning to grasslands is slim. Use of shinnery oak and mixed desert shrub areas by wildlife would not change significantly if mesquite and creosote are controlled.

With such large areas undergoing brush control treatments, the number of animals occupying these areas would drop as a stable grassland habitat is established. For example, in shrub-invaded grassland, inventories show that there is a possibility of 40 reptiles and amphibians, 89 birds, and 25 mammals utilizing the area. In a healthy shortgrass habitat, the numbers of these species present drop to 19 reptiles, 31 birds, and 13 mammals. Shortgrass habitats provide only 102,400 acres for eleven endangered and blue-listed birds, whereas mesquite range supports only seven endangered or blue-listed birds on 780,000 acres.

Provisions would not be made to exempt raptor nest trees within areas which would undergo brush control treatments. At least 75 active nests and three times as many nest sites which are currently inactive would be lost as brush control treatments are repeated. Another 460 acres of broadleaf trees would be subject to brush control treatments, eliminating nesting habitat for 29 species of birds and bedding sites for mule deer.

Forage allocations would be made for antelope and mule deer to assure proper range carrying capacity. Serious conflict with livestock would not exist, except that some overlap in forage areas would continue to occur.

In the short-run, extensive rest periods ranging from 16 months to 2 years would be applied to 1,236,000 acres of public land. After the year 2000, many areas would be approaching excellent conditions when rest from only March to November would be periodically required. As a result, large areas would be subject to nest disturbance and high-yield forb areas would be grazed by both cattle and antelope. The seriousness of this competition in these forb areas during the early spring months would depend on range conditions in other antelope range areas.

Livestock competition with mule deer would be the most serious during the first stages of implementing this alternative. Probably all of the 772,200 acres of mule deer habitat would require only 16 months of rest, since none of this area is in excellent condition. With a 16-month rest, only 25 percent of the area (193,000 acres), would be rested annually. Shinnery oak areas with mule deer habitat (516,800 acres) would still have "off-shinnery" rest in the spring. At that time, competition with cattle would be minimal for only two to four weeks.

Elimination of proposed livestock exclusion areas (6,565 acres) and discontinuing maintenance of existing exclosures (approximately 2,000 acres) would affect lesser prairie chickens, Baird's sparrows (SEII), vesper sparrows (BL), common and endangered raptors, the sandune sagebrush lizard (SEII), and whitetail deer. Twenty-five exclosures (160 acres each) which had been planned to establish nesting habitat for lesser prairie chickens, would not be built. Elimination of these exclosures would impact lesser prairie chickens because this bird requires nesting habitat which is protected from grazing (Brown 1976). Wintering habitat for Baird's sparrow (SEII) and vesper sparrows (BL) would also be lost. Continued access for livestock to 73 acres of desert trees would result in their deterioration or early death through trampling (Heady 1975, Severson and Boldt 1977).

Deterioration or removal of fences at the proposed Mescalero Sands Outstanding Natural Area would allow for eventual cattle use. Competition with livestock would eliminate the remnant herd of whitetail deer and stabilization of dunes which would follow control of brush, together with reseeding with grasses, would eliminate the sandune sagebrush lizard (SEII).

Effect of facilities designed to support livestock would be the same as those described in Chapter 3.

Summary and Conclusion

Successful brush control programs would reduce shrubland habitat by 620,600 acres, eliminate nest sites for 75 raptors, and reduce the mule deer herd by 200 animals.

Cultural Resources

Under this alternative, artifacts would continue to be trampled by livestock. Because stocking rates for livestock are expected to increase from 233,885 AUMs of use to 443,990 AUMs, the possibility for trampling of artifacts would be expected to increase proportionately. Closing of this area to off-road vehicles would decrease damage resulting from this activity. By limiting physical access, there would be a slight reduction on pothunting and vehicular displacement of cultural resources.

Visual Resources

Treatment of an additional 473,920 acres with chemicals to eliminate brush species would not result in any additional impact in the scenic quality. On the other hand, if mechanical means are used, the scars remaining from the use of this equipment would be a short-run loss in the scenic quality until the area had been revegetated or reshaped by natural erosional processes.

Recreation

Implementation of the Livestock Forage Maximization alternative would reduce populations of shrubland birds and small game and thus diminish opportunities for a quality hunting experience on some of the public lands. This would reduce annual recreational use by 28,792 visitor days by the year 2000. All ORV use would be eliminated.

Wilderness

Wilderness review and study are mandated by Section 603 of the Federal Land Policy and Management Act (FLPMA) and this Act mandates that, during this review and study, the public lands shall be managed so as not to impair their suitability for preservation as wilderness. No adverse impacts to wilderness values, should they exist, would occur.

Livestock Grazing

During the short term, the initial reduction to the present forage production (from 233,885 AUMs down to 168,111 AUMs) would result in a loss of grazing opportunities on public lands (65,774 AUMs). In the long term, as the result of brush control on 1,435,284 acres and development of 184 "specific grazing management" systems, vegetative production would increase. Consequently, grazing opportunities would increase to 433,990 AUMs, which is 200,105 AUMs above present levels, and 265,879 AUMs above that resulting from the short-run reduction. Overall, opportunities for operating viable livestock operations would improve.

Economic Conditions

Ranch operations in the ES area would be substantially increased, with herd sizes increasing by an average of nearly 30 percent for all ranches and 40 percent for ranches with "specific grazing management". Livestock sales would rise by 46 percent, or approximately 2.7 million, over 1978 levels, increasing from approximately $5.9 million to $8.5 million. Net cash income to ranchers would climb to $5.3 million, a gain of more than 75 percent. Ranch income in the year 2000 would exceed 1978 levels of $3.4 million by $1,848,256. Projected increases in permitted grazing on public lands in the ES area would enable ranches in all size categories to cover costs although subsistence-size operations would still record losses since they would pay only $4,000 to operators for labor, less than a minimum wage. However, this amount is essentially a break-even point for ranch operators in the smallest category who generally hold other jobs. In conclusion, following the short-term reductions which would severely cripple the economic viability of ranch units, ranching opportunities and abilities to thrive economically would be increased 75 percent under this alternative.

Social Conditions

As the result of economic improvements, ranch units would be strengthened, reinforcing the distinctive set of attitudes and values inherent in ranching. The only remaining source of conflict and change would be the ranchers' continued resistence to government action. This attitude would be somewhat reduced as ranching opportunities improve.

Mitigating Measures

The BLM is not committed to any mitigating measures to lessen or diminish the impacts identified for this alternative, other than those included in the standard operating procedures, design features, and those measures included in Chapter 4. Therefore, all impacts are unavoidable.

LIVESTOCK ADJUSTMENT ALTERNATIVE

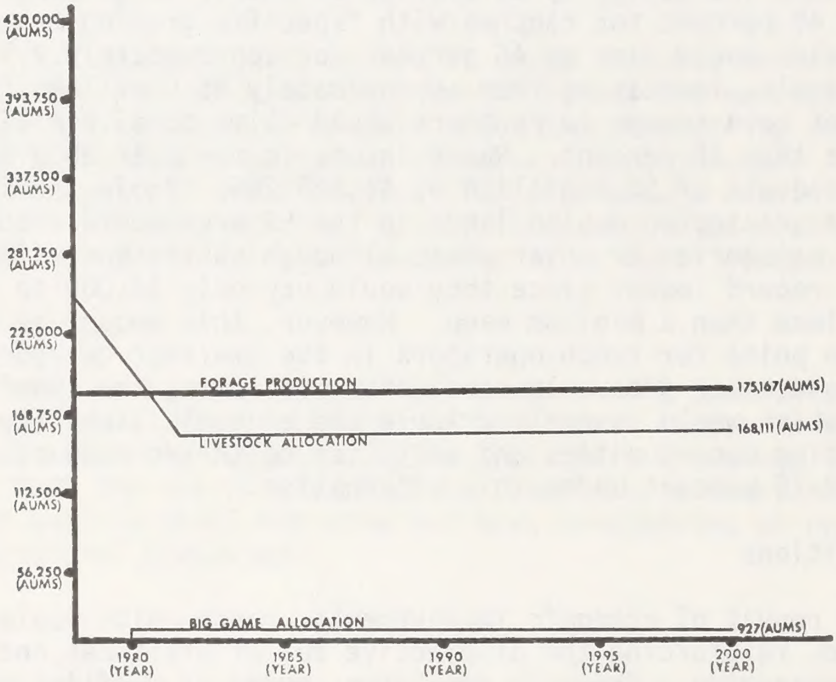
(Alternative 5)

With this alternative, the present situation would continue to exist. Stocking rates for livestock would be adjusted as indicated under the proposed action and as shown on Graph 8-5. Existing allotment management plans would continue to be maintained. No new "specific grazing management" systems would be developed; no additional livestock facilities or vegetative treatments would be permitted.

GRAPH 8-5

ALLOCATION OF FORAGE OVER A 20 YEAR TIME PERIOD

WITH THE LIVESTOCK ADJUSTMENT ALTERNATIVE



Impact Analysis

This alternative would not affect any elements of the physical setting or of air quality.

Vegetation

Brush control programs would not be conducted under this alternative. Improved forage conditions are expected to occur only on the grassland areas of existing AMPs where grazing treatments, along with stocking rate adjustments, would permit improvements in range condition.

The vigor of forage plants on the non-AMPs would improve because pastures would be stocked at levels designed to achieve a moderate level of utilization. Most allottees would apply yearlong grazing pressure with only occasional rest periods. Continuous grazing and the lack of brush control treatments would prevent forage plants from significantly increasing in density or production. Areas with heavy infestations of brush would continue to experience gradual deterioration in ecological condition of their vegetative communities.

Summary and Conclusion

By adjusting livestock grazing only, vegetative conditions would be expected to remain in approximately their present state. There would be some improvement in plant vigor as proper use is maintained and where existing grazing systems provide periodic growing season rest. Overall improvement would not be expected because competition with forage plants for soil moisture would not be removed through brush control treatments.

In conclusion, very little change from the present situation in forage condition or production is anticipated under this alternative.

Threatened or Endangered Plants

No impacts are foreseen to those forbs proposed for inclusion on the Federal List of Threatened Species.

Soils

Erosion rates for soils in the "nonallotment management plan" (AMP) areas would remain the same as at present, ranging from .31 to 1.25 acre-feet per square mile per year. In areas with AMPs, soil erosion would be expected to decrease because of the additional vegetation ground cover. The non-AMP areas would undergo a change in vegetative composition and there would be an improvement in plant vigor but any change in ground cover would be difficult to quantify. Erosion rates for soil series and range sites would be essentially the same as those listed on Tables B-4 and B-5 in Appendix 2. In AMP areas, erosion rates would be expected to be approximately the same as for those areas shown on Tables B-4 and B-5 in Appendix 2 under "allotment-specific grazing management" systems.

Water Production

Withdrawals of ground water would total 150 acre-feet. This would be 125 acre-feet less than the present use-level. This reduction in use would continue for as long as this alternative was followed and would benefit water resources each year by the amount of this reduction.

Wildlife

Aquatic Habitat

Impacts to aquatic habitat under this alternative, would be similar to those described for the alternative of "No Action." Adjustment of stocking rates would have little effect on the improvement of those plant communities or habitats which are adjacent to the river. Conservative stocking would be beneficial, compared to the existing situation (Gay 1965). However, since brush would not be controlled and periods of rest would not be implemented, habitats adjacent to the river which have been invaded by brush would not provide buffer zones necessary to minimize deterioration of the watershed areas or to offer foraging areas for aquatic mammals like raccoons.

Terrestrial Habitat

Effects of this alternative on terrestrial habitat would be the same as for those described under the no action alternative, with one major difference. Livestock adjustments would involve allocation of forage to wildlife and adjustment of livestock numbers to a level which would permit the range to support both wild and domestic herbivores. On both AMP and non-AMP areas, invasion of brush and changes in habitat would tend to take place at a somewhat slower rate if proper stocking levels are achieved.

On AMP and non-AMP areas, changes would be the same as those described for the no action alternative.

Summary and Conclusion

All aquatic and grassland habitat would continue to deteriorate with continued livestock use and brush invasion. Antelope would eventually disappear but mule deer would increase by 200 animals.

Cultural Resources

Under this alternative, livestock could continue to trample artifacts, causing breakage and displacement. Some damage would also occur from horizontal and vertical displacement of artifacts.

Visual Resources

In most instances, adjustment of stocking rates of livestock would improve vegetative cover and variety somewhat, slightly enhancing the scenic quality.

Recreation

Allocation of forage production for wildlife would help to assure the continued availability of quality hunting opportunities on the public lands.

If no additional livestock facilities were constructed, there would be no additional barriers to free movement, allowing for continued use of off-road vehicles and no additional restrictions on hunting. These would be beneficial impacts.

If there were no vegetative treatments (chemical or mechanical) on areas, without "specific grazing management", dove and quail habitat in desert shrub areas would remain unchanged, aiding in the continued availability of quality hunting opportunities for those species on the public lands.

Wilderness

Because wilderness review and study are mandated by Section 603 of the Federal Land Policy and Management Act (FLPMA) and because this Act mandates that, during this review and study, the public lands shall be managed so as not to impair their suitability for preservation as wilderness, the impact of this alternative would be similar to that for the proposed action as shown in Chapter 3. Because livestock numbers would be adjusted to the proper use levels for the range, deterioration of resources would be lessened or stabilized. Wilderness qualities, should they exist, would not be significantly affected.

Livestock Grazing

Livestock numbers on all 184 allotments would be adjusted to comply with of the 1977-78 range survey resulting in a decrease in licensed use of 65,807 AUMs. No other action would be taken except to maintain existing AMPs.

Economic Conditions

The proposed livestock adjustment alternative would cut livestock sales from the ES area by $564,595, from 1978 levels of $5.9 million to $5.3 million in the year 2000. Net cash income to ranchers would decline by $400,464 or 12 percent, with ranch income dropping from $3.4 million in 1978 to $5.3 million at the end of the century. Because of the drop in ranch income, 16-22 ranch operators would be required to obtain off-ranch employment. To the extent that these ranchers would be willing to subsidize livestock production with outside income, they would be able to maintain ranch operations. Some ranchers, however, would be faced with severe, long-term financial difficulties, because allotment cuts would diminish rancher's wealth-capital position. The ability to borrow money would, therefore, decline by at least $3.5 million. With the simultaneous decline in ranch income and ability of ranchers in the ES area to borrow, default on outstanding loans would be made more likely. Overall, in the long-run, 15 to 25 ranches would be expected to become abandoned as commercial ventures, either being sold or being continued as part-time, "hobby" operations.

Mitigating Measures

The BLM is not committed to any mitigating measures to lessen or diminish the impacts identified, other than those included in standard operating procedures, design features, and those proposed for the proposed action in Chapter 4. Therefore, all impacts would be unavoidable.

ENHANCEMENT OF OTHER RESOURCE VALUES (De-emphasis of Livestock Grazing)

(Alternative 6)

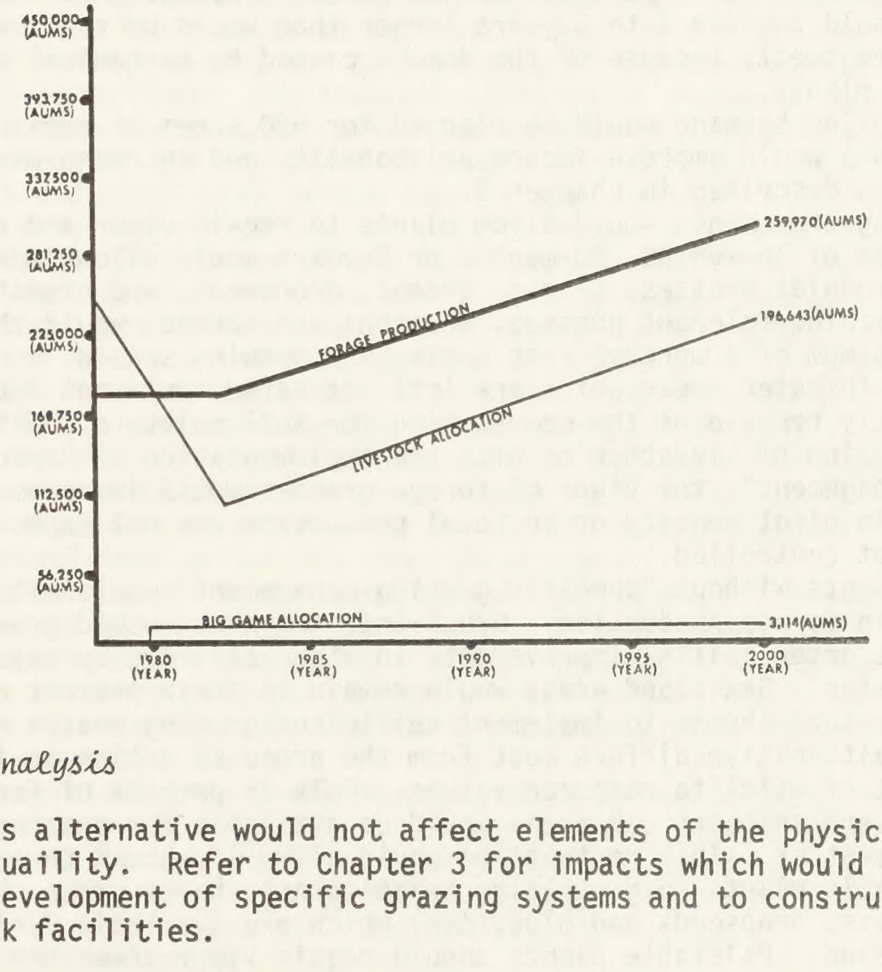
This alternative would resolve conflicts between livestock grazing and other resource values, as identified in the BLM planning system, in favor of the other resource values. It explores the impacts of a lower level of emphasis on livestock grazing and results in a significant lower level of livestock use than the proposed action. This alternative consists of: 1. continued exclusion of livestock from the 5,561 acres of public land in existing unallotted areas; 2. the permanent exclusion of livestock from an additional 21,490 acres of the public lands to provide for study areas and areas set aside for the exclusive use of wildlife; 3. the yearly exclusion of livestock from 50 percent of the shortgrass and shinnery oak areas resulting in 50 percent of the forage being available for the use of wildlife on those areas in the East Eddy and Lea Planning Units (approximately 358,713 acres), thus meeting the needs of deer, antelope, and ground-nesting birds. Fifty percent of the forage production on the remaining shortgrass and shinnery areas would be reserved so that approximately 80 percent of the annual seedhead production would be available for nongame species. This results in 25 percent of the forage production on these areas being available for livestock use; 4. allocation of 3,114 AUMs of forage from the public lands in the Eddy and Lea Planning Units which have big game habitat and allocation of the total forage production on the public lands portion of Section 15 allotments in the Lea Planning Unit; 5. allowing 1,000 acres of saltcedar and 18,560 acres of mixed desert shrub (19,560 acres of public lands) to remain on lands which have been identified as having a potential for increased forage production (nontreatment); 6. the treatment of 264,000 acres of mesquite with herbicides to reduce competition with forage plants for soil moisture; 7. allowing existing prairie dog towns to expand, occupying 600 acres of the public grasslands and with the potential of expanding into another 1,600 acres of the public lands; and 8. the construction of livestock facilities and the development of specific grazing systems, as described in the Proposed Action (Chapter 1).

The allocation of the forage production, existing and anticipated is shown on Graph 8-6. No increases in stocking rates would be allowed until forage production increases have been demonstrated through the results of actual use and utilization studies.

GRAPH 8-6

ALLOCATION OF FORAGE OVER A 20 YEAR TIME PERIOD

WITH THE ENCHANCEMENT OF OTHER RESOURCES ALTERNATIVE



Impact Analysis

This alternative would not affect elements of the physical setting or air quaility. Refer to Chapter 3 for impacts which would occur due to the development of specific grazing systems and to construction of livestock facilities.

Vegetation

On existing and proposed AMPs, 264,000 acres would be treated to control brush. This is 697,364 acres less than for the proposed action. Aerial spraying with the mixture of picloram and dicamba (1/4 lb. each/acre) over the total mesquite cover is expected to kill 40 percent of mesquite on the 178,052 acres to be treated in this manner. Granular treatments of dicamba would kill 40 percent of the total mesquite cover on the

56,872 acres having this treatment. Fifty percent of the creosote would be killed on 29,076 acres following the applicaton of picloram pellets on those areas.

Control of brush would increase available soil moisture, allowing increases in herbage production. Grass plants would not be damaged by the proposed chemicals but actively growing forbs would be killed. Forb production would recover following summer rains. (See Chapter 3 for additional information on effects of chemical control).

Mechanical grubbing would remove 80 to 90 percent of the mesquite stand on two allotments (a total of 440 acres). Recovery of the forage resource would require 3 to 5 years longer than would be required for chemical treatments because of the damage caused by mechanical equipment to growing plants.

Controlled burning would be planned for 520 acres of sacaton and tobosa. This would improve forage palatability and increase plant diversity as described in Chapter 3.

Grazing treatments would allow plants to regain vigor and reproduce. Rest periods of 16-months, 20-months or 2-years would allow improvement of most perennial grasses; (e.g.: gramas, dropseeds, and bluestems). The more grazing-tolerant grasses, sacatons and tobosa, would thrive under a minimum of 4 months' rest during the growing season.

Brush-infested areas which are left untreated would not improve significantly because of the competition for soil moisture. With the total exclusion of livestock or with the implementation of "specific grazing management", the vigor of forage grasses would improve. However, increases in plant density or in total production are not expected if brush is not controlled.

Allotments without "specific grazing management" would not show increases in forage production. Brush-infested areas would gradually deteriorate after initial improvements in vigor afforded by adjusted BLM stocking rates. Grassland areas would remain in their present condition unless operators choose to implement sufficient growing season rest.

This alternative differs most from the proposed action in its enhancement of wildlife resource values. Only 25 percent of forage in shortgrass and shinnery oak areas would be available for grazing each year by livestock. This restriction would allow livestock to eat the most palatable plants (e.g., plains bristlegrass, hairy grama, hooded windmillgrass, dropseeds and bluestems) which are available during the grazing period. Palatable plants should regain vigor after the 25 percent utilization level is reached. This level of forage utilization would allow 80 percent of grass seedheads to remain on pastures for the use of wildlife. Most nonpalatable plants would not be grazed, suffering no loss in vigor. Gradual deterioration of the shinnery oak areas would occur over long periods of time. Shinnery oak would gradually increase on suitable areas unless range condition was good before these rest treatments were initiated. Grassland areas should improve to the "excellent" condition level as described under the proposed action, Chapter 3.

Allocations of forage for wildlife should impact vegetation at the same level as would proper utilization by livestock, with browse and forbs being used slightly more by deer and antelope than by livestock. Data is insufficient to predict precise vegetative responses under this alternative. Hunting opportunities, as determined by the New Mexico Department of Fish and Game, would hold wildlife populations in balance with the carrying capacities of the ES area.

Prairie dogs would be allowed to expand onto eight suitable areas with maximum expansion up to 200 acres for each town. The total increased area which would be impacted by prairie dogs would be 1,600 acres. There would be two impacts on vegetation from this expansion: 1. the amount of herbage eaten, and 2. denuding of the soil surface caused by burrowing activities. The frequent clipping of forage by prairie dogs, at levels near the ground, causes the vegetative community within the feeding range of the dog towns to remain as shortgrass prairie. Brush seedlings and midgrasses seldom survive the low-level clipping and frequent defoliations of feeding prairie dogs. Hansen and Gold (1977) estimated that 24 percent of the total annual plant production in a dog town was destroyed by the dogs and by rabbits associated with dog towns. Prairie dog diets include most tender green plants, roughly 65 percent grasses and 35 percent forbs (Summers and Linder, 1976). Preferred plants were found to be sedges, blue grama, scarlet globemallow (Hansen and Gold 1977), and buffalograss (Summers and Linder 1976). Long-duration beneficial impacts of the prairie dog towns would be aeration of the soil and distribution of nutrients as a result of their burrowing. Although invasions of brush would not occur, most midgrasses would not become established or survive near these towns.

Livestock would be excluded from 22,330 acres. Elimination of grazing would allow initial improvements in plant vigor with corresponding increases of vegetative litter. Brush-infested areas (e.g. mesquite, shinnery oak, and creosote) would either remain unchanged or gradually deteriorate. No increases in herbage plant density or production are expected.

Composition, cover, and forage production would improve on areas where livestock congregate (e.g., playas, ponds, broadleaf tree groves, riparian zone) due to implementation of grazing treatments and to the protection afforded plants by exclusion areas under this alternative.

Summary and Conclusion

Under this alternative, allotments with existing or being proposed for development of "specific grazing management" plans (110 allotments covering 1,513,312 acres of public lands) would be expected to produce a total of 251,286 AUMs of properly usable forage (vegetative production would be in excess of twice this amount; see discussion on proper use in Appendix I). This would be 84,803 AUMs more than the present production. The remaining 76,822 acres within grazing allotments, where grazing treatments would not be made, would be expected to continue to produce forage at the present level of 8,684 AUMs. Improvement in forage plant vigor and ground cover would be expected except on the 1,600 acres of praire dog towns where it would lose its production rate and ground cover completely under this alternative.

In conclusion, this alternative would result in an improved forage production of 84,803 AUMs on 1,513,312 acres, a maintenance of forage production on 75,222 acres and a complete loss in production on 1,600 acres. Overall plant vigor and ground cover would increase over the present level.

Threatened or Endangered Plants

No impacts are foreseen on those forbs proposed for inclusion on the federal lists of threatened species.

Soils

The impact to soils from the introduction of "allotment-specific grazing management" systems, construction of livestock facilities, and exclusion of livestock from the described areas with this alternative, would result in a decrease of soil erosion from 1,037 acre-feet per year to 809 acre-feet per year. Total allocations of forage production for wildlife in Lea County allotments which have less than 20 percent of their total acreage composed of public lands, would be expected to have little effect on soils. Vegetation and the percentage of ground cover in these areas would not be expected to change significantly from those now existing. Allowing prairie dog towns to expand would be expected to have a long-term, localized impact on an additional 1,600 acres. Vegetation and ground cover would be expected to decrease on these areas, increasing soil erosion. The amount of erosion from these small areas is expected to affect less than one-tenth of one percent of the public lands in the ES area. Overall, soil productivity would increase and soil erosion rates would decrease under this alternative.

Water Production and Quality

Withdrawal of ground water would be reduced by 93 acre-feet per year from the present use level of 275 acre-feet per year because of fewer livestock to use it. This reduction would have a minor benefit on the ES area's water supplies for as long as this alternative was followed.

Surface Water

There would be a minor reduction in localized run-off (less than 1 percent) and a minor reduction in total dissolved solids (less than 1 percent), due to improved watershed cover conditions (See Vegetation).

Wildlife

Aquatic Habitat

The Pecos River riparian zone and seven upland playas would be managed in the same manner as shown in Chapter 1. In addition to developing aquatic habitat at 32 dirt tanks, the remaining 164 dirt tanks would also have part of the shoreline excluded from grazing which would benefit amphibians, terrestrial snakes, migrant waterfowl, herons, raptors, songbirds, carnivores, and mule deer.

Terrestrial Habitat

Under this alternative, the major changes benefiting wildlife would result from restrictions placed on livestock grazing. These changes will be described in order of the magnitude of the acreages involved.

Annually, from March 1 to August 1, livestock grazing would not be permitted in the East Chaves Planning Area in order to prevent nest disturbance of ground nesting birds. According to Buttery and Shields (1976), livestock grazing can have significant impacts on ground-nesting birds, particularly under rotational grazing systems. This restriction of livestock use on rangelands would apply on 11,000 acres of mixed desert shrub habitat, 232,000 acres of shinnery oak habitat, 135,000 acres of mesquite grassland, 39,000 acres of shortgrass and 6,000 acres of creosote habitat. Following brush control treatments, this grazing deferment would apply to an additional 135,000 acres of reclaimed grassland.

Grazing systems would also be applied in conjunction with this March to August rest, with many areas receiving more than this minimum annually, where 20-month and 2-year treatments would be applied.

Another restriction on grazing would take place in the East Eddy and Lea Planning Areas where 50 percent of shortgrass and shinnery areas would be deferred from grazing annually from March 1 to June 1. This would affect 359,000 acres before programs to control brush are completed. After chemical treatments are completed, another 264,000 acres of reclaimed grassland would be added. Spring rests would benefit ground-nesting birds such as horned larks, lark buntings, and Cassin's sparrows. Restored plant vigor following spring rest, plus additional rest which would occur with implementation of grazing systems, would benefit seed-eating rodents such as pocket mice and wintering birds like Baird's sparrow (SEII) and scaled quail.

The overall population size of grassland birds may depend on the quality of wintering habitat (Fretwell 1972, Wiens 1974). An abundance of seed supplies would lessen competition for the ES area's sparse seed resources. Insuring that 80 percent of the seedheads of grama grasses, bluestems, canarygrasses, and bristlegrasses would remain ungrazed during the initial implementation stages of allotment management plans (AMPs) in shortgrass and midgrass habitats which are now being heavily grazed, would permit the buildup of seed supplies so that moderate use of this forage resource by livestock could resume. When the range condition began to reach "good to excellent" condition, moderate grazing pressure by livestock (40 - 60 percent use of key forage species) would create and maintain a diversity of height, cover, and density for grass plants which would be favorable to grassland birds (Weatherill and Keith 1969, Wiens and Dyer 1975), rodents (Flinders and Hansen 1975, Olendorff and Stoddart 1973), and the carnivores which depend on these animals as prey.

Protection of forb-producing areas which have high yields, such as San Simon Swale, would be critical in maintaining the ES area's antelope herds (New Mexico Department of Game and Fish, 1977). Ten different basins, totaling 60,000 acres, would be rested annually in the spring when cattle and antelope both compete for forbs before grasses become green. This rest period would affect about 180 antelope which depend on these sites for spring forage.

Fencing 31,950 acres of Section 15 lands would create islands of wildlife habitat in areas where grazing takes precedence in land use. Although all forage would be initially allocated to wildlife, management of these areas for wildlife would eventually involve livestock grazing to remove excess cover, trample seeds, and stimulate plant production (Vickery 1972). Chemical brush control treatments would not be used on these areas, however, fire could be used to retard further brush invasions (Smith and Schmutz 1975) by killing seedlings and younger mesquite plants (Wright 1972).

Black-tailed prairie dogs would be allowed to occupy 600 acres with the potential expansion into eight different areas occupying 1,600 acres. Although prairie dog and livestock conflicts are well known, prairie dogs serve a valuable function in the wildlife community by maintaining areas in a shortgrass aspect, thus providing habitat for classified species, such as burrowing owls (BL) ferruginous hawks, and prairie falcons (BL).

Summary and Conclusion

Habitat conditions for all groups of wildlife would change from a general poor condition towards one approaching excellent. Although habitat quality would improve, no population data is available to predict changes in the case of nongame wildlife. No significant changes would be expected in the case of big game or carnivores.

Cultural Resources

Exclusion of livestock from any given acreage would potentially reduce the breakage of artifacts by trampling, the contamination of radiocarbon samples, and the horizontal or vertical displacement of artifacts. Contamination of materials used for radiocarbon dating by herbicides would be possible on approximately 264,000 acres where chemical treatments for brush control would be applied. Expansion of prairie dog towns in 1,600 more acres would have a detrimental impact on cultural resources because of the potential for their destruction resulting from burrowing activities.

In conclusion based upon analysis made under the proposed action, specific grazing management would result in alteration of artifact dating processes through contamination, displacement, and breakage.

Visual Resources

The exclusion of livestock from 21,490 acres of the public lands would tend to improve the density, diversity, and vigor of the vegatation of those acres. This would possibly improve the scenic quality enough to permit a change in the area's visual resource management (VRM) Class from IV to III.

Recreation

Implementation of the alternative to enhance other resource values would provide for increased opportunities. These should be enough to support the projected demand of 28,792 visitor days expected by the year 2000.

Wilderness

Because wilderness review and study are mandated by Section 603 of the Federal Land Policy and Management Act (FLPMA) and because this Act mandates that, during this review and study, the public lands shall be managed so as not to impair their suitability for preservation as wilderness, any values present would not be affected.

Livestock Grazing

There would be no programs to control brush on the 74 allotments where "no specific grazing management" is proposed. Livestock grazing on 21 of these 74 allotments on the public lands would be eliminated, reducing forage available for grazing use by 6,171 AUMs. Of the remaining 53 allotments, 4 would have livestock exclusion areas, further reducing forage by 65 AUMs. Another reduction of AUMs would result from restrictions on cattle use of grasslands and shinnery oak stands, permitting only 25 percent use by livestock. Overall, the allotment with "no specific grazing management" would lose a total of 10,289 AUMs from the existing licensed use.

There would be approximately 264,000 acres of mesquite control to enhance wildlife habitat. Livestock grazing on 7 of the 90 allotments proposed for implementation of "specific grazing management" systems would be eliminated. This would be a reduction of 9,056 AUMs from licensed use. The 20 AMPs and the remaining 83 allotments proposed for "specific grazing management" systems would also have livestock exclusion areas designated. This would also be a reduction of 3,123 AUMs in the short-run. Only 25 percent of the production of grasslands and shinnery oak types would be available for livestock use. This would be another reduction of approximately 30,500 AUMs in the short-run. In the long-run, a total of 26,953 AUMs would remain lost to livestock from the existing licensed use under this alternative.

Economic Condition

With this alternative, livestock sales would decline from an estimated $5.9 million in 1978 to $4.6 million in the year 2000. Net cash income to ranchers would drop by $871,570, from $3.4 million to $2,549,373 a decrease of 25 percent. Eight to ten ranch employees would be laid off, while ten to fifteen ranch operators would be forced to seek employment in nonranching areas in order to supplement their reduced ranch incomes.

The impacts identified would be permanent, and the diminished viability of the ranch units in the ES area would lead eventually to the closing of 30 to 40 of the ranches, after losses mounted to unacceptable levels. Although these ranch closings would not have a major effect on the economy of southeastern New Mexico as a whole, they would result in the indirect loss of 80 jobs in the region. In the ES area, the abandonment of ranching by these families would adversely affect crossroads trade and service communities, and further depopulate the area.

In conclusion, the economic opportunities for ranches and small communities in the ES area would be reduced significantly, but the economy of the region would remain unchanged.

Mitigating Measures

The BLM is not committed to any mitigating measures to lessen or diminish the impacts identified, other than those included in standard operating procedures, design features, and those proposed for the proposed action in Chapter 4. Therefore, all impacts would be unavoidable.

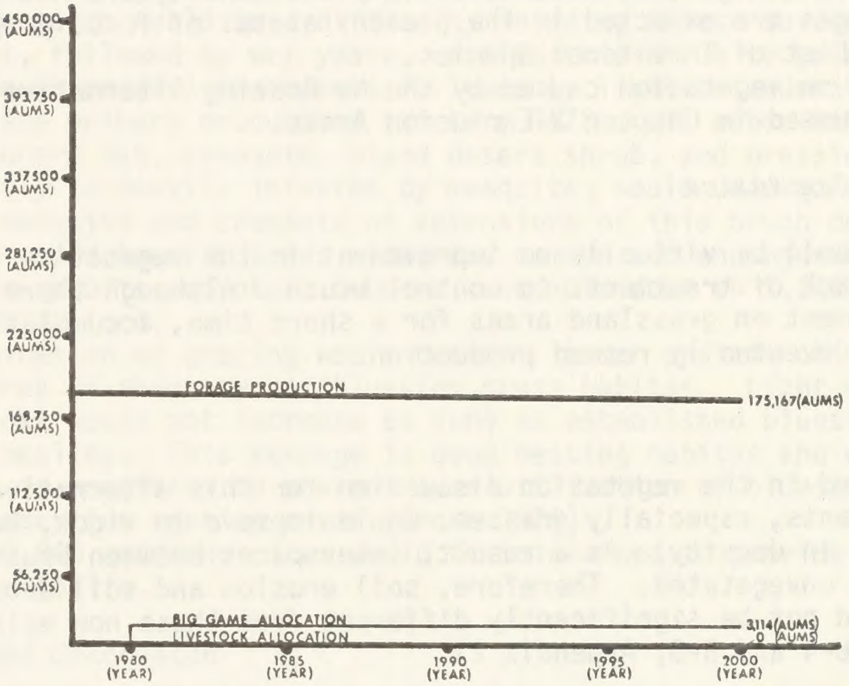
NO GRAZING

(Alternative 7)

This alternative would require the removal of all domestic livestock from the public lands. Implementation of this alternative would: 1. cancel 281,766 AUMs of livestock preference on this ES area's public lands from the use of livestock; 2. provide that no new "specific grazing management" plans be developed and that existing plans would be cancelled; 3. prevent livestock grazing on any lands within this ES area, except for nonpublic lands where the animals could be prevented from utilizing the public lands; 4. require that facilities for livestock not be developed nor maintained on the public lands unless they were required for other resource programs of the BLM; and 5. require that some developments be identified for removal or salvage (Graph 8-7).

GRAPH 8-7

ALLOCATION OF FORAGE OVER A 20 YEAR TIME PERIOD WITH NO GRAZING ALTERNATIVE



Impact Analysis

This alternative would not affect elements of the physical setting or air quality.

Vegetation

Under this alternative, vegetative treatments to control brush, controlled burning, and grazing treatments would not be conducted. Production of forage plants would remain the same as now existing: 175,167 AUMs.

Plants would regain vigor and reproduce without the influence of livestock grazing, trampling, and browsing. This beneficial response would be particularly evident in areas where livestock formerly congregated: playas, dirt tanks, riparian areas, and broadleaf tree groves.

Overall, the ES area's forage resources would not improve in plant composition or production. Brush-infested areas (e.g., mesquite, shinnery oak, creosote) would gradually deteriorate without some type of brush removal. Ungrazed grassland areas would have increases of vegetative litter, approximately 50 to 60 percent total cover. Such improvements were seen on a livestock exclosure on a sandy range site where total cover increased from 31 percent before exclusion to 68 percent after livestock exclusion (data in Appendix B, Table C-2). Palatable plants would improve in vigor, but increases in plant density are not expected.

No changes are expected in the present status of forbs proposed to the Federal List of Threatened Species.

Impacts on vegetation caused by the No Grazing Alternative are further discussed in Chapter 3-Exclusion Areas.

Summary and Conclusion

There would be virtually no improvement in the vegetative resource because of lack of treatments to control brush. Although there would be some improvement on grassland areas for a short time, accumulations of litter would eventually retard production.

Soils

As stated in the vegetation discussion for this alternative, palatable plants, especially grasses, would improve in vigor, but would not increase in density. As a result, interspaces between brush plants would remain unvegetated. Therefore, soil erosion and soil erosion classes would not be significantly different from those now existing (see Tables B-4 and B-5, Appendix 2).

Water Production

Withdrawal of ground water would be reduced from the present use of 275 acre-feet per year to a point where withdrawal for livestock use would cease. This reduction in use would benefit the ES area's water resources for as long as this alternative was followed.

Wildlife

Aquatic Habitat

Under this alternative, fencing of riparian areas would not be required. Aquatic plants would become established at 196 dirt tanks, but, without brush control treatments, advancing mesquite would continue to deteriorate grassland communities. This would decrease grass cover and could result in soil movements as precipitation is received. Soil movements would eventually cause dirt tanks to become filled with silt and, therefore, useless.

Long range predictions cannot be made as to when or if the ES area's watershed would reach conditions where siltation would affect water quality in the Pecos River's aquatic habitat.

Terrestrial Habitat

Removal of livestock would result in a brief flush of plant vigor among existing grasses and would benefit seed-eating birds, small rodents, and insects. On grasslands which are in excellent condition (58,000 acres), mesquite would have difficulty invading unless several periods of drought, followed by wet years, enabled this shrub to gain a foothold. Without brush control treatments followed by light to moderate grazing to stimulate primary production (Vickery 1972), all other habitats, e.g.: shinnery oak, creosote, mixed desert shrub, and grasslands which were lightly to heavily infested by mesquite, would undergo rapid invasions of mesquite and creosote or extensions of this brush cover. Such increases would benefit toads, lizards, common and endangered shrubland birds, jackrabbits, coyotes, bobcats, and mule deer on 1,342,500 acres of the public land.

Elimination of grazing would benefit lesser prairie chickens on 32,900 acres of shinnery oak/bluestem grass habitat. Light densities of shinnery oak would not increase as long as established bluestem grasses remained healthy. This acreage is good nesting habitat and exclusion of livestock is necessary to prevent over-utilization of bluestems which are necessary for nesting cover (Brown 1976).

All 4,940 watering sites would be maintained to provide for the needs of wildlife.

Summary and Conclusion

Aquatic and grassland habitat would deteriorate because of complications caused by advancing brush. Antelope would disappear, but mule deer would increase by 200 animals.

Cultural Resources

By totally excluding livestock from the area, trampling, mechanical breakage of artifacts, and contamination of radiocarbon samples by livestock would not occur.

Visual Resources

The additional vegetative cover resulting from the removal of livestock and associated livestock facilities from the public lands would improve their scenic quality. However, some viewers expecting to see the traditional herds of cattle, corrals, and windmills on the western range would not consider their removal as an improvement.

Recreation

This alternative would provide for increased hunting opportunities by allocating most forage production to wildlife and for the elimination of existing livestock facilities while preventing construction of new facilities, thus giving more freedom of movement to both hunters and users of off-road vehicles.

Wilderness

The additional vegetative cover resulting from the removal of livestock and associated livestock facilities would enhance any wilderness values that may be present in the ES area.

Livestock Grazing

All grazing on the public lands would cease but grazing would continue on those private and state lands which are within the present allotments and which could be managed in such a way as to prevent use on public lands. The reductions from present licensed use would total about 233,885 AUMs.

Economic Conditions

With adoption of the no grazing alternative, the ranching economy of the ES area would undergo drastic changes. Livestock sales would drop $3.8 million, or 64 percent from estimated levels in 1978. Net cash income to ranchers would decline from $3.4 million in 1978 to approximately $717,030 million in the year 2000. Ranches in all size categories would be rendered unprofitable, and operators would incur heavy losses in seeking to maintain operations. Rancher's wealth-capital position would drop by more than $21 million, and the borrowing power of ranchers would be cut by $8.5 million. With diminished incomes and reduced ability to borrow, ranch operators would have difficulty repaying existing debts. An increase in the number of defaults, and an adverse impact on financial institutions would result. More than 50 of the ranches in the ES area would close their livestock operations in order to cut losses or because of default or outstanding loans, and 50 to 60 operators and 10 to 15 employees would have to find alternative means of employment. Approximately 120 workers in industries related to beef production would lose their jobs. Trade and service centers in the ES area and in adjacent parts of southeastern New Mexico would lose business as ranch families abandoned operations and left the area.

Overall, the ranching economy and livelihood of small ranching communities would be eliminated.

Social Conditions

The traditional ranching economy, and the lifestyles and values which were associated with it, would be largely eliminated.

Mitigating Measures

The BLM is not committed to any mitigating measures to lessen or diminish the impacts identified. Therefore, all impacts would be unavoidable.

TABLE 8-2
SUMMARY OF KEY ELEMENTS FOR THE PROPOSED ACTION AND THE ALTERNATIVES
(Source: Roswell District Files)

	EXISTING ENVIRONMENT	PROPOSED ACTION	PROPOSED ACTION USING ALTERNATIVE CHEMICALS	PROPOSED ACTION WITH MECHANICAL CONTROL ONLY	NO ACTION	LIVESTOCK MAXIMIZATION	LIVESTOCK ADJUSTMENT	ENHANCEMENT OF OTHER RESOURCES	NO GRAZING
LIVESTOCK GRAZING									
SPECIFIC GRAZING SYSTEMS (ACRES)	582,956	1,507,467	1,507,467	1,507,467	582,956	1,513,312	582,956	1,492,972	0
EXCLUDED FROM LIVESTOCK (ACRES)	0	6,565	6,565	6,565	0	0	0	21,940	0
VEGETATIVE TREATMENTS									
CHEMICAL BRUSH CONTROL (ACRES)	125,992	960,924	960,924	0	0	1,434,844	0	264,000	0
MECHANICAL BRUSH CONTROL (ACRES)	0	440	440	263,056	0	440	0	440	0
BURNING OF VEGETATION (ACRES)	0	520	520	520	0	520	0	520	0
FACILITIES									
FENCES (MILES)	2,718	3,113	3,113	3,113	2,718	3,113	2,718	3,113	2,718
WATERS (SITES)	743	989	989	989	743	989	743	989	743
CATTLE GUARDS	442	442	442	442	442	442	442	443	442
CORRALS	67	67	67	67	67	67	67	67	67

NOTE: Total public lands involved equals 1,595,695. Each alternative includes the units contained in the existing environment with the exception of vegetative treatments.

TABLE 8-3
COMPARISON OF IMPACTS FOR MAJOR RESOURCE COMPONENTS
Proposed Action and Alternatives
(Source: Roswell District Files)

Area of Impact	Unit of Measure	Existing Environment	With Proposal Year 2000	Proposal Using Alternate Chemicals Year 2000	Proposal With Mechanical Brush Control Year 2000	No Action Year 2000	Livestock Maximization Year 2000	Livestock Adjustment Year 2000	Enhancement of Other Resource Values Year 2000	No Grazing
VEGETATION										
Forage Production	AUMs	175,167	371,710	371,710	244,015	175,167	436,883	175,167	259,970	175,167
Condition										
Good	Acres	352,000	1,306,000	1,306,000	730,000	185,000	1,590,000	320,000	685,000	775,000
Fair	Acres	1,169,000	245,000	255,000	830,000	1,300,000	0	1,200,000	745,000	750,000
Poor	Acres	69,000	29,000	29,000	30,000	105,000	0	70,000	60,000	65,000
Cover	Percent	25	55	55	55	25	55	25	55	55
Composition										
Mesquite										
40% kill	Acres	0	845,614	845,614	0	0	845,614	0	234,924	0
90% kill	Acres	0	440	440	175,490	0	440	0	0	0
Creosote										
50% kill	Acres	0	115,310	115,310	87,610	0	115,310	0	29,076	0
Shinnery Oak										
20% kill	Acres	0	148,500	0	0	0	473,920	0	0	0
70% kill	Acres	0	0	148,500	0	0	0	0	0	0
SOILS										
Sediment Yield of Total Specific Grazing Mgmt. Areas	Acre ft.	1,037	809	809	809	1,037	809	1,037	809	809
		Sediment yields are relative values valid only for analysis and identifying trends								
Herbicide pollution of soils	Presence of herbicides in soils	0	0	0	0	0	0	0	0	0
WATER RESOURCES										
Ground Water Resources	Acre ft.[1]	275	374	374	232	210	448	150	182	6
Localized Run-off	Percent Increase (I) or Decrease (D)	-	D1	D1	D1	I1	D1	-	D1	D1
Water Quality	Percent Improved (I) or Reduced (R)	-	I1	I1	I1	R1	I1	-	I1	I1
WILDLIFE		[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]
Aquatic Habitat										
Pecos River	Miles of Stream	42-P	42-I	42-I	42-I	42-D	42-D	42-D	42-I	42-I
Playas	Acres	35-P	35-I	35-I	35-I	35-D	35-D	35-D	35-I	35-I
Dirt Tanks	Acres	98-P	16-I 82-MP	16-I 82-MP	16-I 82-MP	98-D	98-D	98-D	98-I	98-I
Terrestrial Habitat										
Shrublands	Acres	533,700-F	70,700-I 464,000-D	70,700-I 264,000-MF 200,000-D	70,700-I 155,000-MF 308,000-D	533,700-I	62,400-I 471,300-D	533,700-I	70,700-I 199,000-MF 264,000-D	1,342,000-I 58,000-MP
Grasslands	Acres	102,400-F 464,000-P	566,400-I	289,000-I 102,400-MF 175,000-D 148,500-A	308,000-I 102,400-MF 156,000-MP	377,900-MP 88,400-D	566,400-I 959,500-A	377,900-MP 88,400-D	102,400-I 264,000-I 200,000-MP	1,342,000-D 68,000-MG
Broadleaf Trees	Acres	460-F	50-I 410-D	50-I 410-D	50-I 410-D	460-D	460-D	460-D	460-I	460-I

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[1] Based on the average consumption of 12 gallons per animal per day.

[2] P: Poor; F: Fair; G: Good; M: Maintained; I: Improved; D: Deteriorated; A: Habitat added with treatment.

[3] Based upon projected demands from the Bureau Planning System. Limitation on these activities results from forces other than livestock grazing (e.g., oil and gas activities, etc.)

TABLE 8-3
COMPARISON OF IMPACTS FOR MAJOR RESOURCE COMPONENTS
Proposed Action and Alternatives
(Source: Renwald 1979 and Roswell District Files)

Area of Impact	Unit of Measure	Existing Environment	With Proposal Year 2000	Proposal Using Alternate Chemicals Year 2000	Proposal With Mechanical Brush Control Year 2000	No Action Year 2000	Livestock Maximization Year 2000	Livestock Adjustment Year 2000	Enhancement of Other Resource Values Year 2000	No Grazing
CULTURAL RESOURCES	C-14 Contamination	Small amount. What does occur is a result of natural processes such as rootlet growth	Increasing	Same as proposal	Same as existing environment	Same as existing environment	Increasing at a greater rate than under the proposed action	Increasing but limited to those areas with specific grazing management	Same as the existing environment	Same as the existing environment
	Artifact Loss	Artifacts are currently being removed by erosion and pot hunting	Increase as a result of proposal. When proposed action plus the future environment are considered together, the impact is greater than either one alone	Same as proposal	Increase at a greater rate than the proposal	Increasing but not as much as under the proposed action	Increase at greater rate than under the proposed action	Increase limited to those areas with specific grazing management	Increase but not as great as under the proposed action.	Same as for no action
VISUAL RESOURCES	Class Change Grazing	0	Improvement	Improvement	Deterioration	Deterioration	Deterioration	Improvement	Improvement	Improvement
	Class Change Range Projects	0	Static	Static	Deterioration	Deterioration	Deterioration	Static	Improvement	Improvement
RECREATION ORV Use	Visitor[1] Days	1,700	2,741	2,741	2,741	2,741	0	2,741	2,741	2,741
Hunting	Visitor Days	18,300	28,792	28,792	28,792	Undetermined	Undetermined	28,792	28,792	28,792
WILDERNESS	Suitability	Static	Static	Static	Static	Static	Static	Static	Static	Static
LIVESTOCK GRAZING USE*	AUMs	233,885								
	Short-run		168,111	168,111	168,111	221,351	168,111	168,111	111,840	0
	Long-run		367,442	367,442	240,831	221,351	433,990	168,111	196,643	0
	Specific Grazing Allotments	20								
	Short-run		110	110	110	20	184	20	102	0
	Long-run		110	110	110	20	184	20	102	0
	Non-specific Grazing Allotments	164								
	Short-run		74	74	74	164	0	164	53	0
	Long-run		74	74	74	164	0	164	**53	0

*Data for public lands within allotments. Data for lands within allotments unallotted acres not included.
**Twenty-nine allotments would be eliminated from livestock grazing on public land due to enhancement of resource values.

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[1] Based on the average consumption of 12 gallons per animal per day.
[2] P: Poor; F: Fair; G: Good; M: Maintained; I: Improved; D: Deteriorated; A: Habitat added with treatment.
[3] Based upon projected demands from the Bureau Planning System. Limitation on these activities results from forces other than livestock grazing (e.g., oil and gas activities, etc.)

TABLE 8-3
COMPARISON OF IMPACTS FOR MAJOR RESOURCE COMPONENTS
Proposed Action and Alternatives

(Source: Harbridge House, Inc., 1979, Socioeconomic Study of Proposed Grazing Management Program, East Roswell Grazing Environmental Statement Area, on file at Roswell District Office, Bureau of Land Management

Area of Impact	Unit of Measure	Existing Environment	With Proposal Year 2000	Proposal Using Alternate Chemicals Year 2000	Proposal With Mechanical Brush Control Year 2000	No Action Year 2000	Livestock Maximization Year 2000	Livestock Adjustment Year 2000	Enhancement of Other Resource Values Year 2000	No Grazing
ECONOMIC CONDITIONS										
Ranch Categories										
Subsistence										
Livestock Sales (Receipts)	1978 dollars	162,140	286,900	286,900	219,380	188,780	322,840	204,100	134,500	49,180
Net Cash Income (before depreciation)		48,220	122,200	122,200	62,560	52,560	161,580	55,520	25,320	(42,260)
Net Business Income (after depreciation)		(32,960)	41,020	41,020	(18,960)	(27,840)	80,640	(27,160)	(56,420)	(117,420)
Percent Return on Investment		(7.1)	(4.4)	4.4	(6.6)	(6.9)	(3.0)	(6.9)	(8.0)	(10.2)
Small Commercial										
Livestock Sales (Receipts)		1,131,386	1,301,882	1,301,882	1,159,432	1,201,131	1,750,581	1,016,279	934,102	456,617
Net Cash Income (before depreciation)		606,245	770,414	770,414	632,737	655,492	720,316	494,949	438,672	52,577
Net Business Income (after depreciation)		254,523	418,692	418,692	290,376	300,810	1,647,316	138,787	95,978	(309,505)
Percent Return on Investment		(0.3)	0.8	0.8	(0.1)	(0.001)	2.8	(1.1)	(1.4)	(4.0)
Medium Commercial										
Livestock Sales (Receipts)		2,261,420	2,634,679	2,634,679	1,787,038	2,428,750	3,278,798	1,793,534	1,536,826	882,557
Net Cash Income (before depreciation)		1,381,850	1,650,738	1,650,738	1,088,834	1,510,407	2,074,747	1,092,778	890,677	400,113
Net Business Income (after depreciation)		789,902	1,058,790	1,058,790	558,569	932,263	1,499,706	560,599	335,298	(105,125)
Percent Return on Investment		1.9	2.8	2.8	1.1	2.4	4.4	1.1	0.3	(1.2)
Large Commercial										
Livestock Sales (Receipts)		2,334,780	3,030,720	3,030,720	2,116,926	2,749,208	3,240,356	2,311,218	2,048,662	718,858
Net Cash Income (before depreciation)		1,384,628	1,820,770	1,820,770	1,234,464	1,643,152	1,963,794	1,359,232	1,194,704	306,600
Net Business Income (after depreciation)		797,160	1,233,302	1,233,302	641,844	1,043,966	1,357,958	746,550	621,222	(229,418)
Percent Return on Investment		2.3	3.7	3.7	1.8	3.1	4.1	2.1	1.7	(1.1)
All Ranch Categories										
Livestock Sales (Receipts)		5,889,726	7,254,181	7,254,181	5,282,776	6,567,869	8,592,575	5,325,131	4,654,090	2,107,212
Net Cash Income (before depreciation)		3,420,943	4,364,122	4,364,122	3,018,595	3,861,611	5,269,199	3,002,479	2,549,373	717,030
Net Business Income (after depreciation)		1,808,625	2,751,804	2,751,804	1,471,829	2,249,199	3,658,620	1,418,776	996,078	(761,468)
Percent Return on Investment		1.3	2.5	2.5	0.9	1.9	3.7	0.8	0.2	(2.0)

Note: Parentheses ( ) indicate negative numbers.

TABLE 8-4
COMPARISON OF IMPACTS FOR WILDLIFE COMPONENTS
Proposed Action and Alternatives
(Source: Renwald 1979 and Roswell District Files)

Area of Impact	Unit of Measure	Existing Environment	With Proposal Year 2000	Proposal Using Alternate Chemicals Year 2000	Proposal With Mechanical Brush Control Year 2000	No Action Year 2000	Livestock Maximization Year 2000	Livestock Adjustment Year 2000	Enhancement of Other Resource Values Year 2000	No Grazing
WILDLIFE										
FISH (common and endangered)	Miles of Stream	P:[1] 42-P[2]	P: 42-I	P: 42-I	P: 42-I	P: 42-D	P: 42-D	P: 42-D	P: 42-I	P: 42-I
AMPHIBIANS Toads	Acres	SO,M,D,C: 1,269,000 G SG,B,R: 135,000 P	SO,M,D,C: 1,269,000 D SG,B,R: 135,000 MP	SO,D: 147,000 MG SO,M; 1,122,000 D SG,B,R: 135,000 MP	SO,M,D: 1,130,600 MG SG,B,R: 135,000 MP MC: 138,000 D	SO,M,D,C: 1,269,000 MG SG,B,R: 135,000 MP	SG,B,R: 135,000 MP SO,M,D,C: 1,269,000 D	SO,M,D,C: 1,269,000 NG SG,B,R: 135,000 MP	SO,D,C: 287,600 MG MG,M,SO; 981,400 D SG,R,B: 135,000 MP	SO,D,MC: 1,342,000 I SG: 58,000 MP
Frogs	Miles of Stream	P: 42-P	P: 42-I	P: 42-I	P: 42-I	P: 42-D	P: 42-D	P: 42-D	P: 42-I	P: 42-I
Eastern Barking Frog (SEII)	Acres	Unknown	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
REPTILES Turtles (common and endangered)	Miles of Stream	P: 42-P	P: 42-I	P: 42-I	P: 42-I	P: 42-D	P: 42-D	P: 42-D	P: 42-I	P: 42-I
Lizards	Acres	SO,M,D,C: 1,269,000 G SG,B,R: 135,000 P	SO,M,D,C: 806,000 MG SG,B,R: 135,000 MP M: 463,000 D	SO,M,D: 921,000 MG SG,B,R: 135,000 MP SO,M,C: 348,000 D	SO,M,D: 727,000 MG SG,B,R: 135,000 MP SO,M,C: 173,000 D	SO,M,D,C: 1,269,000 MG SG,B,R: 135,000 MP	SG,B,R: 135,000 MP SO,M,D,C: 1,269,000 D	SO,M,D,C: 1,269,000 MG SG,B,R: 135,000 MP	SO,D,C: 287,600 MG SG,M,SO 981,400 D SG,R,B: 135,000 MP	SO,D,M,C: 1,342,000 I SG: 58,000 MP
Sandune Sagebrush Lizard (SEII)	Acres	SO: 1,885 G SO: 16,015 F	SO: 1,885 MG SO: 16,015 MF	SO: 1,885 MG SO: 16,015 D	SO: 1,885 MG SO: 16,015 MF	SO: 1,885 MG SO: 16,015 MF	SO: 1,885 MG SO: 16,015 MF	SO: 1,885 MG SO: 16,015 MF	SO: 1,885 MG SO: 16,015 D	SO 1,885 MG SO 16,015 MF
Snakes Aquatic Snakes (common and endangered)	Miles of Stream	P: 42-P	P: 42-I	P: 42-I	P: 42-I	P: 42-D	P: 42-D	P: 42-D	P: 42-I	P: 42-I
Terrestrial Snakes	Acres	SG: 58,000 G SO,M,D: 870,000 F M,C,B: 476,000 P	SG: 58,000 MG SO,M,C,D: 1,309,000 I B: 39,000 MP	SG: 58,000 MG SO,M,D: 1,121,000 I M,C,B: 225,000 MP	SG: 58,000 MG M,D 308,000 I SO,M,SG: 591,000 MF M,C,B: 225,000 MP	SO,M,D: 986,900 MF C,B: 16,500 MP SG: 58,000 D	SG: 58,000 MG SO,M,C,D: 1,346,000 I	SO,M,D: 986,900 MF C,B: 16,500 MP SG: 58,000 D	SG: 102,400 MG M: 264,000 I SO,D: 587,700 MF SO,M: 449,900 MP	SO,D,M,C: 1,342,000 D SG 58,000 MG
Endangered Snakes Mottled Rock Rattlesnake (SEII)	Acres	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Trans-Pecos Rat Snake (SEII)	Acres	D: 32,000 F	D: 32,000 I	D: 32,000 I	D: 32,000 I	D: 9,900 MF	D: 32,000 J	D: 9,900 MF	D: 32,000 I	D: 32,000 D

[1] SO: Shinnery Oak
M: Mesquite
D: Mixed Desert Shrub
SG: Shortgrass
MG: Midgrass
R: Riparian
B: Bottomland, Drainage Sacaton
C: Creosote
P: Pecos River
DT: Dirt Tank

[2] P: Poor
F: Fair
G: Good
E: Excellent
I: Improved
D: Deteriorated
M: Maintained
A: Habitat added with treatment

TABLE 8-4
COMPARISON OF IMPACTS FOR WILDLIFE COMPONENTS
Proposed Action and Alternatives
(Source: Renwald 1979 and Roswell District Files)

Area of Impact	Unit of Measure	Existing Environment	With Proposal Year 2000	Proposal Using Alternate Chemicals Year 2000	Proposal With Mechanical Brush Control Year 2000	No Action Year 2000	Livestock Maximization Year 2000	Livestock Adjustment Year 2000	Enhancement of Other Resource Values Year 2000	No Grazing
BIRDS Aquatic Birds (common and endangered)	Miles of Stream	P: 42-P	P: 42-I	P: 42-I	P: 42-I	P: 42-D	P: 42-D	P: 42-D	P: 42-I	P: 42-I
	Surface Acres	DT: 133 P	DT: 51 I DT: 82 MP	DT: 51 I DT: 82 MP	DT: 51 I DT: 82 MP	DT: 133 D	DT: 133 D	DT: 133 D	DT: 133 I	DT: 133 D
Grassland Birds (common and endangered)	Acres	SG: 102,400 F M,SO: 464,000 P	SG,M: 566,400 I	M,SO: 289,000 I SG: 102,400 MF M,SO: 175,000 D SO: 148,500 A	M: 308,000 I SG: 102,400 MF M,SO: 156,000 MP	M,SO: 377,900 MP SG: 88,400 D	SG,M,SO: 566,400 I M,C,D,SO: 959,500 A	M,SO: 377,900 MP SG: 88,400 D	SG: 102,400 MG M: 264,000 I M: 200,000 MP	SO,D,M,C: 1,342,000 D SG: 58,000 MG
Shrubland Birds (common and endangered)	Acres	M,D,SO: 533,700 F	D: 70,700 I M,SO: 464,000 D	D: 70,700 I M: 264,000 MF SO,M: 200,000 D	D: 70,700 I M,SO: 155,000 MF M: 308,000 D	M,D,SO 533,700 I	D: 62,400 I M,SO,D: 471,300 D	M,D,SO: 533,700 I	D: 70,700 I M: 199,000 MF M: 264,000 D	SO,D,M,C: 1,342,000 I SG: 58,000 MP
Broadleaf Tree Birds (common and endangered)	Acres	T: 453 F	T: 50 I T: 410 D	T: 50 I T: 410 D	T: 50 I T: 410 D	T: 460 D	T: 460 D	T: 460 D	T: 460 I	T: 460 I
Lesser Prairie Chicken	Acres	SO: 494,000 P SO: 12,000 F SO: 15,300 G	SO: 506,000 I SO: 15,300 MG	SO: 506,000 I SO: 15,300 MG	SO: 506,000 I SO: 15,300 MG	SO: 494,000 MP SO: 27,300 D	SO: 1,900 MG SO: 519,400 D	SO: 494,000 MP SO: 27,300 D	SO: 1,900 MG SO: 519,400 I	SO: 15,300 MG SO: 12,000 MF SO: 494,000 MP
MAMMALS Aquatic Mammals	Miles of Stream	P: 42-P	P: 42-I	P: 42-I	P: 42-I	P: 42-D	P: 42-D	P: 42-D	P: 42-I	P: 42-I
	Surface Acres	DT: 133 P	DT: 51 I DT: 82 MP	DT: 51 I DT: 82 MP	DT: 51 I DT: 82 MP	DT: 133 D	DT: 133 D	DT: 133 D	DT: 133 I	DT: 133 D

TABLE 8-4
COMPARISON OF IMPACTS FOR WILDLIFE COMPONENTS
Proposed Action and Alternatives
(Source: Renwald 1979 and Roswell District Files)

Area of Impact	Unit of Measure	Existing Environment	With Proposal Year 2000	Proposal Using Alternate Chemicals Year 2000	Proposal With Mechanical Brush Control Year 2000	No Action Year 2000	Livestock Maximization Year 2000	Livestock Adjustment Year 2000	Enhancement of Other Resource Values Year 2000	No Grazing
Terrestrial Mammals										
Coyotes	Acres	M,SO,D,R: 1,594,000 G	SO,M,D,R: 1,333,000 MG M: 264,000 D	M,SO,D,R: 846,000 MG SO,M: 748,000 D	M,SO,D,R: 1,128,500 MG M,C: 308,000 D	M,SO,D,R: 1,594,000 MG	M,SO,D,R: 1,330,000 MG M: 264,000 D	M,SO,D,R: 1,594,000 MG	M,SO,D,R: 1,330,000 MG M: 264,000 D	M,SO,P,R,C: 1,536,000 I SG: 58,000 MF
Bobcats	Acres	M,SO,D,R: 591,000 F C,M,SO,SG: 1,003,000 P	M,SO,D,R: 1,230,600 I SG: 102,400 MP M: 264,000 D	SO,M,D,R: 1,491,600 I SG: 102,400 MP	M,SO,D,R: 1,026,100 MF SG: 102,400 MP M: 308,000 D	SO,M,D,R: 1,491,600 MF SG: 13,900 MP	SO,SG,B: 591,000 MF M,SO,D: 739,000 I M: 264,000 D	SO,M,D,R: 1,491,600 MF SO,M,D,R: 102,400 MP	M,SO,D,R: 1,113,000 MF C,SG: 217,000 MP M 264,000 D	M,SO,D,R,C: 1,536,000 I SG: 53,000 MP
Badgers	Acres	SG: 102,400 F M,SO: 423,700 P	SG,M,SO: 526,100 I	SG: 102,400 MF SO: 159,000 I M: 264,000 MP	SG: 102,400 MF M,SO: 269,000 I SO: 154,700 MP	SG: 13,900 MF SG,M,SO: 512,200 MP	SG: 102,400 MF M,SO: 423,700 I	SG: 13,900 MF SG,M,SO: 512,200 MP	SG: 102,400 MF M,SO: 423,700 I	M,SO,SG: 468,000 D SG: 58,000 MG
Jackrabbits, Cottontails, Kangaroo rats	Acres	M,SO,D: 851,000 G SG: 102,400 F C,R,B: 118,600 P	C,R,B,D: 189,300 I SG: 102,400 MF M,SO: 780,300 D	C,R,B: 118,600 I SG: 102,400 MF M,D: 264,000 MG M,SO: 587,000 D	C,R,B: 118,600 I SG: 102,400 MF M,D,SO: 543,000 MG M: 308,000 D	D: 22,000 I SG: 13,900 MF M,SO,D: 1,036,000 MG	SG: 102,400 MF SO,M,D: 1,485,900 D	D: 22,000 I SG: 13,960 MF M,SO,D: 1,036,000 MG	SO,M,D: 1,103,300 MG SG: 102,400 MF M: 264,000 D C,R,SO: 118,600 MP	M,SO,D,C: 1,532,300 I R: 3,700 MP SG: 58,000 MF
Ground squirrels, Pocket mice	Acres	SG: 102,400 G M,SO,D,R: 898,900 P	SG: 102,400 MG M,SO,D,R: 898,900 I	SG: 102,400 MG M,SO,D,R: 634,000 I M: 264,000 MP	SG: 102,400 MG M,SO,D,R: 898,900 I	SG 13,900 MG M,SO,D: 987,200 MP	SG: 102,400 MG M,SO,D: 898,900 I	M,SO,D: 987,200 MP	SG: 102,400 MG M,SO,D: 898,900 I	SO,M,C,D: 943,300 D SG: 58,000 MG
Mule deer	Acres	SO: 516,000 G M,O,R,B: 142,000 F M: 160,000 P	SO: 516,000 MG D,R,B: 102,000 I M: 195,000 D	SO: 516,000 MG D,R,B: 102,000 I M,SO: 182,200 D M: 17,000 MP	SO: 556,100 MG D,R,B: 102,000 I M: 261,900 D	SO: 459,900 MG SO: 104,900 I M,D,R,B: 253,200 MF	M,SO,D,B: 814,600 D R: 3,400 MF	SO: 459,900 MG SO: 104,900 I M,D,R,B: 253,200 MF	SO: 516,000 MG M,D,R,B: 185,000 I M: 160,000 MP	SG,M,SO,D,R: 818,000 I
White-tailed deer	Acres	SO: 1,900 F SO: 26,000 P	SO: 1,900 MF SO: 26,000 I	SO: 1,900 MF SO: 26,000 MP	SO: 1,900 MF SO: 26,000 MP	SO: 1,900 MF SO: 11,520 I SO: 14,480 MP	SO: 1,900 MF SO: 26,000 D	SO: 1,900 MF SO: 11,520 I SO: 14,480 MP	SO: 1,900 MF SO: 26,000 I	SO: 1,900 MF SO: 26,000 MP

TABLE 8-4
COMPARISON OF IMPACTS FOR WILDLIFE COMPONENTS
Proposed Action and Alternatives
(Source: Renwald 1979 and Roswell District Files)

Area of Impact	Unit of Measure	Existing Environment	With Proposal Year 2000	Proposal Using Alternate Chemicals Year 2000	Proposal With Mechanical Brush Control Year 2000	No Action Year 2000	Livestock Maximization Year 2000	Livestock Adjustment Year 2000	Enhancement of Other Resource Values Year 2000	No Grazing
Antelope	Acres	SG:[1] 102,400 G[2] SO: 387,600 F SO,M,D: 563,000 P	SG: 102,400 MG SO,M,D: 900,600 I SO,M: 50,000 MP	SG: 102,400 MG M,SO: 636,600 I M: 314,000 MP	SG: 102,400 MG M,D: 115,000 I SO,M: 563,600 MP SO: 272,000 MF	SG: 13,900 MG SO: 77,230 MF SO,M,D: 674,200 MP SO: 240,000 D	SG: 102,400 MG M,SO,D: 950,600 I	SG: 13,900 MG SO: 77,230 MF SO,M,D: 674,200 MP SO: 240,000 P	SG: 102,400 MG M,SO,D: 950,600 I	SG,M,SO,D: 995,000 D SG: 58,000 MF

[1] SO:	Shinnery Oak;
M:	Mesquite
D:	Mixed Desert Shrub
SG:	Shortgrass
MG:	Midgrass
R:	Riparian
B:	Bottomland, Drainage Sacaton
C:	Creosote
P:	Pecos River
DT:	Dirt Tank

[2] P:	Poor
F:	Fair
G:	Good
E:	Excellent
I:	Improved
D:	Deteriorated
M:	Maintained
A:	Habitat added with treatment

TABLE 8-5
SUMMARY OF EFFECTS ON LIVESTOCK USE BY ALLOTMENT
(Source: Roswell District Files and Analysis in Chapter 8)

Allot. No.	Name	Proposed Action Using Alternative Chemicals		Proposed Action Using Mechanical Controls		No Action		Livestock Maximization		Livestock Adjustment		Enhancement Of Other Resources		No Grazing
		Short-Run (AUMs)	Long-Run (AUMs)	Short-Run (AUMs)	Long-Run (AUMs)	Short-Run (AUMs)	Long-Run (AUMs)	Short-Run (AUMs)	Long-Run (AUMs)	Short-Run (AUMs)	Long-Run (AUMs)	Short-Run (AUMs)	Long-Run (AUMs)	(AUMs)
Existing Specific Grazing Systems														
5043	Sand Ranch	980	1,104	980	1,089	980	980	980	2,172	980	980	281	281	0
5046	Caprock Ranch	755	755	755	802	755	755	755	2,604	755	755	60	60	0
5053	Culp, C.	2,424	2,591	2,424	2,526	2,424	2,424	2,424	4,428	2,424	2,424	465	465	0
5063	Culp, J.	321	529	321	321	321	321	321	1,140	321	321	84	84	0
5075	Bogle	21,204	46,113	21,204	35,889	21,204	21,204	21,204	53,112	21,204	21,204	12,255	34,402	0
5077	Williams, P.	1,951	2,413	1,951	2,421	1,951	1,951	1,951	4,968	1,951	1,951	300	300	0
5078	Slash ML Ranch	556	752	556	649	556	556	556	1,572	556	556	231	231	0
6007	Caviness	1,660	4,466	1,660	2,059	1,660	1,660	1,660	5,904	1,660	1,660	1,261	1,635	0
6022	Bingham	338	714	338	497	338	338	338	840	338	338	338	754	0
6028	Brininstool, W.	1,038	4,009	1,038	1,171	1,038	1,038	1,038	3,960	1,038	1,038	1,038	1,038	0
6037	Diamond & Half, Inc.	3,341	7,263	3,341	3,927	3,341	3,341	3,341	7,308	3,341	3,341	3,339	8,115	0
6038	James	5056	8,287	5,056	5,673	5,056	5,056	5,056	8,328	5,056	5,056	5,049	5,656	0
6039	Robbins	1,073	1,915	1,073	1,271	1,073	1,073	1,073	2,640	1,073	1,073	791	1,438	0
6040	Brininstool, C.	746	1,644	746	803	746	746	746	1,644	746	746	746	746	0
7007	Haines	439	1,022	439	439	439	439	439	1,572	439	439	210	210	0
7019	Rains	317	1,453	317	1,140	317	317	317	1,464	317	317	23	23	0
7032	Sanders	8,544	20,787	8,544	9,997	8,544	8,544	8,544	20,940	8,544	8,544	8,544	8,750	0
7036	Madera & McDonald	1,717	5,862	1,717	2,574	1,717	1,717	1,717	5,940	1,717	1,717	1,702	3,835	0
7040	Jackson	5,410	17,837	5,410	13,321	5,410	5,410	5,410	18,324	5,410	5,410	5,393	20,844	0
7042	Twinwells	4,249	12,356	4,249	6,802	4,249	4,249	4,249	12,708	4,249	4,249	4,234	6,993	0
Subtotal 1		62,119	141,872	62,119	93,371	62,119	62,119	62,119	161,568	62,119	62,119	46,344	95,860	0
Proposed Specific Grazing Systems														
5005	Denton	673	915	673	959	1,200	1,200	673	1,560	673	673	159	159	0
5007	Cooper, M.	517	770	517	745	480	480	517	816	517	517	517	517	0
5010	Moorhead	266	266	266	288	516	516	266	612	266	266	251	251	0
5012	Moorhead	514	536	514	593	720	720	514	996	514	514	465	465	0
5014	McDowell - West	139	139	139	139	384	384	139	528	139	139	33	33	0
5018	Bilberry	313	313	313	325	584	584	313	1,032	313	313	0	0	0
5019	Cooper, M.	542	880	542	764	537	537	542	912	542	542	542	542	0
5020	Sturgeon	569	1,011	569	999	1,011	1,011	569	1,104	569	569	569	569	0
5021	Wagner	666	1,059	666	960	853	853	666	1,104	666	666	666	666	0
5024	Durham	1,017	1,017	1,017	1,017	663	663	1,017	984	1,017	1,017	895	895	0
5025	Marley	1,224	1,224	1,224	1,168	813	813	1,224	1,296	1,224	1,224	1,156	1,156	0
5028	Bilbrey	912	1,353	912	1,212	1,839	1,839	912	1,356	912	912	150	150	0
5029	McCombs	416	416	416	431	663	663	416	744	416	416	102	102	0
5032	Davis	1,002	1,002	1,002	1,069	1,656	1,656	1,002	2,196	1,002	1,002	127	127	0
5034	Seeligson	1,532	2,420	1,532	1,968	2,869	2,869	1,532	3,180	1,532	1,532	423	423	0
5036	Cooper, C.	811	811	811	804	482	482	811	780	811	811	811	811	0
5037	McCrea	2,318	2,836	2,318	2,709	2,315	2,315	2,318	3,708	2,318	2,318	2,318	2,318	0
5038	Graham, Ly.	866	1,985	866	924	2,698	2,698	866	1,992	866	866	812	812	0
5039	Sand Hills	192	192	192	274	335	335	192	396	192	192	191	191	0
5040	Harral	928	1,045	928	1,045	1,255	1,255	928	1,056	928	928	98	98	0
5044	Isler	182	182	182	182	186	186	182	348	182	182	45	45	0
5047	Hilburn	476	476	476	491	314	314	476	732	476	476	262	262	0
5049	Clemmons & Erdman	692	692	692	692	840	840	692	1,368	692	692	163	163	0
5051	Marley	2,985	3,134	2,985	3,158	2,713	2,713	2,985	4,524	2,985	2,985	287	287	0
5057	Tigner	352	352	352	352	228	228	352	228	352	352	76	76	0
5058	Lynch	289	583	289	583	555	555	289	624	289	289	0	0	0
5062	Garnsey	1,014	1,074	1,014	1,056	710	710	1,014	1,128	1,014	1,014	427	427	0
5065	Graham, A.	837	928	837	914	898	898	837	1,464	837	837	161	161	0
5066	Spears	461	669	461	681	406	406	461	478	461	461	329	329	0
5068	Malstrom	1,409	2,178	1,409	1,773	2,145	2,145	1,409	3,744	1,409	1,409	379	379	0
5069	VHV Cattle	1,654	2,325	1,654	2,136	2,601	2,601	1,654	2,448	1,654	1,654	801	801	0
5072	Watson	933	2,463	933	2,443	879	879	933	2,568	933	933	742	742	0
5073	Derrick, M.	495	791	495	552	521	521	495	792	495	495	236	236	0
5074	Barbe	1,283	1,680	1,283	1,402	1,050	1,050	1,283	1,968	1,283	1,283	196	196	0
5079	S & S Corp.	177	461	177	213	340	340	177	660	177	177	119	119	0
5082	Gomez	40	137	40	57	56	56	40	156	40	40	40	40	0

(A) Combined with other 6044
(B) Combined with 6045 above
(C) In process of being combined with 7037

TABLE 8-5
SUMMARY OF EFFECTS ON LIVESTOCK USE BY ALLOTMENT
(Source: Roswell District Files and Analysis in Chapter 8)

Allot. No.	Name	Proposed Action Using Alternative Chemicals		Proposed Action Using Mechanical Controls		No Action		Livestock Maximization		Livestock Adjustment		Enhancement Of Other Resources		No Grazing
		Short-Run (AUMs)	Long-Run (AUMs)	Short-Run (AUMs)	Long-Run (AUMs)	Short-Run (AUMs)	Long-Run (AUMs)	Short-Run (AUMs)	Long-Run (AUMs)	Short-Run (AUMs)	Long-Run (AUMs)	Short-Run (AUMs)	Long-Run (AUMs)	(AUMs)
5083	Wilson	190	940	190	472	597	597	190	1,140	190	190	190	190	0
5084	Greenwood	1,025	1,992	1,025	1,592	1,412	1,412	1,025	1,992	1,025	1,025	963	963	0
5085	Taylor & Medlin	610	1,189	610	961	1,068	1,068	610	1,644	610	610	441	441	0
5088	Derrick & Merritt	474	1,376	474	1,069	502	502	474	1,452	474	474	131	131	0
5090	Sams & Dean	313	528	313	506	540	540	313	912	313	313	156	156	0
5091	Derrick, R.	74	462	74	353	333	333	74	468	74	74	58	58	0
5092	Merritt, Wm.	765	1,024	765	850	588	588	765	1,032	765	765	524	524	0
6004	Warren	420	860	420	455	444	444	420	864	420	420	420	420	0
6006	Caswell	3,037	4,859	3,037	3,091	1,786	1,786	3,037	4,872	3,037	3,037	3,037	3,037	0
6008	Linam	981	986	981	981	1,300	1,300	981	2,436	981	981	238	238	0
6009	Scharbauer	3,376	4,120	3,376	3,513	2,902	2,902	3,376	4,560	3,376	3,376	1,262	1,330	0
6011	Smith, M.	1,398	1,760	1,398	1,519	2,155	2,155	1,398	4,092	1,398	1,398	264	264	0
6020	Berry	2,122	3,083	2,122	2,115	3,334	3,334	2,122	4,692	2,122	2,122	1,337	1,582	0
6021	Smith, Wm.	1,558	3,111	1,558	1,558	3,245	3,215	1,558	4,176	1,558	1,558	1,284	1,635	0
6027	Merchant	2,082	3,330	2,082	2,082	2,968	2,968	2,082	4,152	2,082	2,082	0	0	0
6029	Ward	682	887	682	851	1,151	1,151	682	24	682	682	0	0	0
6030	Deep Well	304	489	304	304	612	612	304	756	304	304	0	0	0
6033	Dinwiddie	1,978	5,146	1,978	2,011	2,919	2,919	1,978	5,268	1,978	1,978	1,978	3,756	0
6035	Madera, R.	1,770	2,834	1,770	1,770	2,225	2,225	1,770	4,200	1,770	1,770	1,690	4,412	0
6042	Dublin	337	1,002	337	337	804	804	337	1,128	337	337	0	0	0
6043	Beckham	1,833	3,746	1,833	1,833	2,141	2,141	1,833	3,792	1,833	1,833	1,833	1,833	0
6044	Madera, M.	202	556	202	222	1,916	1,916	202	4,764	202	202	202	202	0
6044	Madera, M.	2,592	3,901	2,592	2,592	(A)	(A)	2,592	(A)	2,592	2,592	2,592	2,607	0
6045	Madera, M & K.	333	1,506	333	332	1,777	1,777	333	5,400	333	333	332	332	0
6045	Madera, M & K.	1,090	4,408	1,090	1,150	(B)	(B)	1,090	(B)	1,090	1,090	1,083	1,950	0
6045	Madera, M & K.	896	3,472	896	890	2,237	2,237	896	3,480	896	896	890	1,610	0
6046	McDonald	339	1,229	339	339	706	706	339	1,236	339	339	339	339	0
7003	Holeman	350	1,056	350	350	567	567	350	1,056	350	350	350	1,133	0
7004	Martin	1,232	4,464	1,232	1,239	1,262	1,262	1,232	4,740	1,232	1,232	1,224	3,649	0
7005	Johnson, G.	105	173	105	105	221	221	105	264	105	105	9	50	0
7006	Gissler	399	455	399	399	672	672	399	528	399	399	234	264	0
7008	Williams	1,286	5,211	1,286	1,322	2,740	2,740	1,286	6,048	1,286	1,286	1,021	1,249	0
7011	Netherlin	380	1,125	380	532	923	923	380	1,128	380	380	122	317	0
7012	Snyder	9,573	19,677	9,573	11,956	21,141	21,141	9,573	23,664	9,573	9,573	3,851	8,291	0
7013	Slash X Ranch	3,724	14,064	3,724	8,161	7,365	7,365	3,724	14,484	3,724	3,724	2,681	5,126	0
7014	Stagner & Forehand	571	1,465	571	1,192	342	342	571	1,476	571	571	0	0	0
7015	Angell	1,187	4,080	1,187	3,209	1,507	1,507	1,187	4,236	1,187	1,187	676	3,876	0
7016	Fanning	985	1,459	985	1,446	1,134	1,134	985	1,860	985	984	801	1,575	0
7018	Clayton	222	1,115	222	1,085	377	377	222	1,356	222	222	127	152	0
7020	Spears, J.	1,106	4,787	1,106	4,075	1,933	1,933	1,106	4,336	1,106	1,106	230	230	0
7021	Campbell	1,211	3,003	1,211	1,943	1,959	1,959	1,211	3,108	1,211	1,211	1,176	1,726	0
7022	Key	3,542	12,379	3,542	7,500	6,332	6,332	3,542	13,824	3,542	3,542	2,900	7,300	0
7025	West	437	1,579	437	1,089	421	421	437	1,596	437	437	437	562	0
7026	Pue	180	755	180	430	418	418	180	756	180	180	180	218	0
7027	Smith	3,849	14,741	3,849	5,983	6,568	6,568	3,849	15,048	3,849	3,849	3,825	3,878	0
7028	Clark	833	2,019	833	1,129	1,174	1,174	833	2,220	833	833	831	1,631	0
7031	Grandi	1,447	7,546	1,447	5,105	2,766	2,766	1,447	7,896	1,447	1,447	1,227	1,448	0
7033	Mobley	1,037	3,926	1,037	2,209	1,309	1,953	1,037	4,248	1,037	1,037	1,024	1,371	0
7034	Greenwood	382	1,817	382	1,491	1,067	1,066	382	2,028	382	382	184	184	0
7035	J & M Farms	433	1,498	433	1,216	205	205	433	1,584	433	433	425	736	0
7037	Delaware	1,658	4,790	1,658	3,461	2,040	2,040	1,658	6,444	1,658	1,658	0	1,343	0
7038	Delaware	77	(C)	77	(C)	192	192	77	(C)	77	77	(C)	(C)	0
7039	Lindsay	1,432	4,837	1,432	2,745	2,957	2,957	1,432	5,220	1,432	1,432	1,617	5,419	0
7041	Johnson, W.	458	1,936	458	833	819	819	458	2,016	458	458	469	2,413	0
Subtotal 2		97,573	217,098	97,573	139,041	143,747	143,747	97,573	249,778	97,573	97,573	60,299	95,586	0
No Specific Grazing Systems														
5001	Sea Cattle	348	348	348	348	660	660	348	552	348	348	348	348	0
5002	Gainer	25	25	25	25	72	72	25	108	25	25	25	25	0
5003	N. Plains Land & Inv.	15	15	15	15	40	40	15	36	15	15	15	15	0
5004	Boone	436	436	436	436	768	768	436	888	436	436	414	414	0
5006	Van Eaton	11	11	11	11	48	48	11	552	11	11	11	11	0
5008	Van Eaton	351	351	351	351	410	410	351	804	351	351	349	349	0
5009	Marley	236	236	236	236	552	552	236	492	236	236	215	215	0
5011	Moorhead	204	204	204	204	516	516	204	516	204	204	169	169	0
5013	Goods, Inc.	182	182	182	182	384	384	182	516	182	182	159	159	0
5014	McDowell - East	18	18	18	18	72	72	18	36	18	18	18	18	0
5015	Southard, F.	13	13	13	13	36	36	13	36	13	13	13	13	0
5016	Southard, T.	117	117	117	117	144	144	117	336	117	117	101	101	0
5017	Southard, J.	37	37	37	37	60	60	37	84	37	37	37	37	0
5022	Smith, H.	79	79	79	79	36	36	79	79	79	79	79	79	0
5023	White	169	169	169	169	212	212	169	216	169	169	169	169	0

TABLE 8-5
SUMMARY OF EFFECTS ON LIVESTOCK USE BY ALLOTMENT
(Source: Roswell District Files and Analysis in Chapter 8)

Allot. No.	Name	Proposed Action Using Alternative Chemicals		Proposed Action Using Mechanical Controls		No Action		Livestock Maximization		Livestock Adjustment		Enhancement Of Other Resources		No Grazing
		Short-Run (AUMs)	Long-Run (AUMs)	Short-Run (AUMs)	Long-Run (AUMs)	Short-Run (AUMs)	Long-Run (AUMs)	Short-Run (AUMs)	Long-Run (AUMs)	Short-Run (AUMs)	Long-Run (AUMs)	Short-Run (AUMs)	Long-Run (AUMs)	(AUMs)
5026	Faircloth	214	214	214	214	216	216	214	264	214	214	214	214	0
5027	Nuckols	49	49	49	49	144	144	49	192	49	49	35	35	0
5030	Jenkins	46	46	46	46	84	84	46	84	46	46	46	46	0
5031	Huston	210	210	210	210	243	243	210	372	210	210	210	210	0
5033	Cato	91	91	91	91	144	144	91	120	91	91	91	91	0
5035	Whitelakes	90	90	90	90	192	192	90	252	90	90	90	90	0
5039	Red Tank	9	9	9	9	16	16	9	24	9	9	9	9	0
5039	Sherman Cattle	46	46	46	46	80	80	46	96	46	46	46	46	0
5042	Glenn	68	68	68	68	108	108	68	180	68	68	68	68	0
5045	Caprock Ranch	135	135	135	135	316	316	135	372	135	135	135	135	0
5050	Clemmons Erdman	224	224	224	224	468	468	224	528	224	224	224	224	0
5052	Marley	9	9	9	9	12	12	9	12	9	9	9	9	0
5054	Irvin	129	129	129	129	84	84	129	132	129	129	129	129	0
5056	Graham, Li.	87	87	87	87	60	60	87	96	87	87	87	87	0
5059	Wilson	106	106	106	106	228	228	106	180	106	106	106	106	0
5060	Sallee	31	31	31	31	24	24	31	84	31	31	31	31	0
5061	Woods	83	83	83	83	43	43	83	83	83	83	83	83	0
5064	Lee	109	109	109	109	176	176	109	264	109	109	109	109	0
5070	Miles	52	52	52	52	60	60	52	72	52	52	52	52	0
5071	Glass	11	11	11	11	12	12	11	12	11	11	11	11	0
5081	Greer	111	111	111	111	138	138	111	264	111	111	111	111	0
5089	Medlin, B.	60	60	60	60	180	180	60	120	60	60	60	60	0
5093	Haley	4	4	4	4	12	12	4	24	4	4	4	4	0
6001	McCrory	10	10	10	10	12	12	10	12	10	10	10	10	0
6002	Field	4	4	4	4	5	5	4	12	4	4	4	4	0
6003	Taylor & Heidel	6	6	6	6	11	11	6	12	6	6	6	6	0
6010	Snyder, L.T.D.	50	50	50	50	96	96	50	144	50	50	0	0	0
6012	Sims	2	2	2	2	12	12	2	12	2	2	0	0	0
6013	Klein	40	40	40	40	78	78	40	24	40	40	0	0	0
6014	S & W Cattle	83	83	83	83	406	406	83	348	83	83	0	0	0
6015	Kornegay	72	72	72	72	300	300	72	312	72	72	0	0	0
6016	Terry	75	75	75	75	197	197	75	156	75	75	0	0	0
6017	Hill	39	39	9	39	236	236	39	156	39	39	0	0	0
6018	Turland	57	57	57	57	116	116	57	360	57	57	0	0	0
6019	Cooper, D.	66	66	66	66	269	269	66	228	66	66	0	0	0
6024	Wallach	10	10	10	10	23	23	10	36	10	10	0	0	0
6025	Robinson	237	237	237	237	526	526	237	624	237	237	0	0	0
6026	Robinson	127	127	127	127	180	180	127	276	127	127	0	0	0
6028	Brininstool, Wm.	79	79	79	79	252	252	79	408	79	79	0	0	0
6029	Ward	4	4	4	4	20	20	4	24	4	4	4	4	0
6031	Goins	73	73	73	73	158	158	73	120	73	73	0	0	0
6032	Winters	47	47	47	47	216	216	47	168	47	47	0	0	0
6034	Wylie	244	244	244	244	408	408	244	624	244	244	0	0	0
6035	Madera, R.	598	598	598	598	612	612	598	1,806	598	598	0	0	0
6036	Madera, R.	4	4	4	4	24	24	4	912	4	4	0	0	0
6041	Dinwiddie	82	82	82	82	48	48	82	204	82	82	0	0	0
6047	Deck	296	296	296	296	490	490	296	840	296	296	0	0	0
6048	Maddox	798	798	798	798	1,524	1,524	798	1,800	798	798	0	0	0
6049	Snyder, L.T.D. - Hart	380	380	380	380	713	713	380	780	380	380	380	380	0
6050	Hilburn	10	10	10	10	12	12	10	12	10	10	10	10	0
7001	Haven	48	48	48	48	176	176	48	312	48	48	48	48	0
7002	Harr	35	35	35	35	120	120	35	132	35	35	35	35	0
7009	Evans	35	35	35	35	96	96	35	264	35	35	35	35	0
7010	Solt	154	154	154	154	347	347	154	660	154	154	154	154	0
7017	Greenwood, H.	34	34	34	34	180	180	34	348	34	34	34	34	0
7023	Beker, Ind.	78	78	78	78	104	104	78	252	78	78	78	78	0
7024	Simpson	136	136	136	136	175	175	136	588	136	136	136	136	0
7029	Bond	158	158	158	158	210	210	158	444	158	158	148	148	0
7030	Tracy	33	33	33	33	84	84	33	156	33	33	33	33	0
Subtotal 3		8,419	8,419	8,419	8,419	15,486	15,486	8,419	22,644	8,419	8,419	5,197	5,197	0
Subtotal 1		62,119	141,872	62,119	93,371	62,119	62,119	62,119	161,568	62,119	62,119	46,344	95,860	0
Subtotal 2		97,573	217,098	97,573	139,041	143,747	143,747	97,573	249,778	97,573	97,573	60,299	95,586	0
Subtotal 3		8,419	8,419	8,419	8,419	15,486	15,486	8,419	22,644	8,419	8,419	5,197	5,197	0
Grand Total		168,111	367,389	168,111	240,831	221,352	221,352	168,111	433,990	168,111	168,111	111,840	196,643	0

(A) Combined with other 6044
(B) Combined with 6045 above
(C) In process of being combined with 7037

CHAPTER 9

CONSULTATION AND COORDINATION

Chapter 9

CONSULTATION AND COORDINATION

The East Roswell Grazing Environmental Statement (ES) Team was formally organized in August 1978. Team members were Bureau of Land Management (BLM) professionals who were assigned to the Roswell District Office. These professionals furnished expertise in vegetation, soils, hydrology, wildlife, livestock, cultural resources, visual resources, wilderness, recreation, watershed, minerals, geology, public affairs, and editing. The majority of the socioeconomics data used in this ES was provided by Harbridge House, Inc., of Boston, under BLM contract. This contract was supervised by Roswell District and New Mexico State Office specialists.

Team members were chosen for their knowledge of the ES area. To supplement their knowledge, team members completed a two-day course in writing environmental statements at Alamogordo, New Mexico, in April 1978.

Preparation of the Draft Environmental Statement: Public Participation

During the preparation of the draft environmental statement (DES), the team was in contact with other federal offices, state and local agencies, interest groups, and individuals. Communication varied from formal, written comments to informal personal contact. Information concerning the proposed action and BLM's role in developing both the proposed action and possible alternatives was extensively covered in the local media. Files in the Roswell District Office (BLM) contain records of personal and telephone contacts.

Prior to preparing the draft ES, the BLM issued contracts for collection of data concerning forage production, plant phenology, available plant species, threatened or endangered plants, water quality, socioeconomics, and soils.

A public participation plan was initiated in October 1975, soon after the Roswell District was notified to prepare an ES. In November 1975, a public meeting was held in Roswell to explain procedures to be used in researching and writing the east Roswell ES to the concerned public. Open houses were held in Carlsbad and Hobbs during October 1976 to interpret the BLM planning system and the proposed ES effort to the public.

During the allotment-inventory process in 1976-77, numerous contacts were made with ranchers holding BLM grazing permits. In August 1977, the District again held an open house to explain the range survey techniques being used. Other public meetings were held in Carlsbad in March and June 1978 to further explain the planning system and the ES in an effort to elicit comments. Five area ranchers, members of the District Grazing Advisory Board, provided input during a briefing at the Roswell District Office in September 1978.

The following comments are samples of written and oral responses received by the BLM as a result of these public meetings and briefings. A complete file is available at the District office.

The Wilderness Society, Southwest Office: Should protect natural areas, riparian areas, and wildlife habitat on the Pecos River above Red Bluff Reservoir.

Eddy County Commissioners: Against land-use planning at county level.

Bureau of Reclamation: Support saltcedar control in Brantly Dam and McMillan Delta areas.

Fish and Wildlife: Informal contacts were made. There will be no effect on vegetation or wildlife, therefore, no formal contacts were necessary.

United States Forest Service: Should immediately stop overgrazing east of the Pecos River (East Eddy Planning Unit).

Soil Conservation Service: Should establish cooperative agreements between the BLM, SCS, and ranchers.

New Mexico Commissioner of Public Lands: Notify the commission of any changes possibly affecting state lands.

County Extension Service: The BLM should control erosion and eradicate brush.

Carlsbad Sportsman Club: Improve vegetative cover and availability of water for livestock and wildlife needs. Fencing and grazing rotation practices are needed to produce the greatest benefit for both livestock and wildlife production. Need viable herds of antelope and javelina. Lesser prairie chickens should be established in the area.

New Mexico Environmental Improvement Agency: Consider the EIA's "Pecos River Basin Plan." Does the BLM plan correlate with EIA's?

Budd Hebert, Oilman: Against unclear statements regarding "proper environmental constraints to protect wildlife and visual resources." Where will cottonwood groves be located? Questions what "custodial management" means. What is the effect on other resources of building exclosures for wildlife?

Southeastern New Mexico Grazing Association: Against cottonwood planting, sale of vegetative products, cattle guard recommendations. For educational program regarding gates and access problems, predator control, erosion control, brush eradication, removal of saltcedar. Against shades and fencing of broadleaf trees.

Mississippi Chemical Corporation: Questions phrase "environmental constraints to protect visual resource values." Questions validity of Maroon Cliffs as critical watershed.

Various Ranchers: Opposed to antelope-type fencing. For using herbicides and building retention dams. Opposed to forced management by government. Want flexibility on allotments and control of predators by ranchers. Too much land taken out of production.

Other Individuals: Would like 100-acre study area exclosure by habitat type put back in Management Framework Plan (MFP). Archeological resources need protection from collectors.

Congressional Inquiry by Artesia Chamber of Commerce: Should take rancher experience into account. Too costly to achieve land treatments, given rainfall requirements.

News Coverage: News and feature stories released to newspapers and broadcast media have informed the public about progress on the environmental statement (ES), as well as advertised dates and times for public meetings.

Opinions Sought

Throughout the ES planning and preparation, specialists from other agencies, organizations and universities, as well as private individuals, have been sought for their expertise and opinions. A summary of these comments follows.

New Mexico State University

Richard Spellenberg, Professor, Dept. of Biology

Comments: *Phacelia* is not palatable and is foul smelling. It is an annual and has vigorous growth, reaching one inch to two feet tall, depending on the amount of rainfall. Dr. Spellenberg observed a *Limonium* plant near Socorro in an intensively cattle-grazed area: the plant was untouched. *Limonium* has a massive, vigorous root system.

Texas Tech University

David Northington, Professor, Dept. of Biology

Comments: *Phacelia* is rarely, if ever, grazed. It could survive some trampling. It likes borrow ditches and other wet spots. *Proboscidea* is unpalatable. It is a delicate plant not usually seen in highly disturbed areas.

Texas Tech University

Ron Sosebee, Professor, Dept. of Range and Wildlife

Comments: Probably the most effective chemicals for mesquite control in the Roswell District, in order of effectiveness, are: 1. Tordon-225 (Picloram plus 2,4,5-T), 2. Dicamba, 3. 2,4,5-T, 4. Silvex, and 5. Picloram.

Area Ranchers

Bud Eppers, Lloyd Treat, George Teal, Bill Ball, and Truman Pierce

Comments: Concerned with requirement to obtain approval to change kinds of livestock and season of use on application. Adjustment of stocking on segregated public lands may impact management on private and state lands. Concerned with proposal to base future livestock adjustment on utilization and production: lag-time in determining change might result in damage by overuse or underuse. Exclusion areas may result in losses due to lack of water and danger of "dogies". Intensive grazing systems imply heavy use during some period -- better to use specific grazing systems terminology; inflexibility could cause economic impact; small parcels exchanged or disposed of to nonpermittees could cause adverse social impact; could conflict with state laws on exchange of use. Land treatment could reduce animal usage for two years in a row following treatment. Three-wire fences could affect breeding programs.

Lincoln University

Bill Leifeste, Instructor and Brush Control Specialist
Comments: Following herbicide treatment of mesquite-infested sand areas, most forbs were killed, but new forbs rapidly emerged following the first good rains. Eventual herbage composition is dominated by bristlegrass and dropseed. Mesquite control would allow increased grass density except where grass cover was already good. Grasses within a treated shinnery stand improve in vigor and, therefore, increase in total production. Grass density increases may gradually occur if shinnery is retreated for several years. Long-term livestock exclusion from shinnery oak range without a herbicide treatment would probably not yield a significant increase in grass density. Improved grass vigor may occur depending on shinnery density.

Krueger Enterprises, Inc.

Mr. Krueger
Comments: Regarding possible contamination of cultural resources by chemical spraying of range plants with diesel fuel base spray, if the chemicals percolated into the soil and if water-soluable products attached themselves to the charcoal, they would have an effect on carbon dating. However, these contaminants would be removed by chemical treatments. Diesel fuel wouldn't be removed by this process but probably wouldn't be a problem. It would be useful to know of the diesel contamination beforehand to compensate for its presence.

Coordination With Other Agencies

In addition to these comments, the BLM has coordinated with several other agencies. Informal contacts have been made with the U. S. Fish and Wildlife Service regarding the effect of the proposed action on any threatened or endangered species or its habitat.

Results of this coordination and the findings of BLM vegetation and wildlife specialists indicate that the proposed action would not adversely impact the threatened vegetation or wildlife. Therefore, no formal consultation is necessary.

The Soil Conservation Service has provided valuable information which helped to formulate the anticipated results of the proposed action and alternatives on vegetative production.

A coordination meeting with the State of New Mexico concerning the involvement of state lands in the proposed action was held in July 1978. Close coordination would be necessary throughout the process of developing a grazing system.

Consultation with the State Historic Preservation Officer has been accomplished to determine which archeological and historical sites within the ES area are eligible for nomination to the National Register of Historic Places (See letter in the Appendix 5). This consultation also included the determination of adequacy of the identification of impacts on cultural resources and the adequacy of the expressed measures for their protection.

A number of other planning agencies in the ES area also have been consulted.

Lea County Land Use Planning and Zoning Board wrote the LEA COUNTY LAND USE PLANNING REPORT in December 1973. Some of its recommendations are pertinent to this ES effort and are paraphrased below:

1. Range Recommendation: We advise recommended carrying capacities indicated. Rotation or deferred grazing programs are highly desirable because resting a piece of land at varying times through the year permits the desirable varieties of grasses and herbs to mature and reseed. Unnecessary disturbance of the soil should be avoided.
2. Weeds and Shrubs Recommendation: Landowners are advised to seek the expertise and technical assistance of government agencies in initiating their own programs of weed and shrub control.
3. Rodents Recommendation: Ranchers should be allowed to make an effort to control prairie dogs in order to decrease soil and water erosion through an increase in grass cover.
4. Predators Recommendation: Coyote control is essential to the agricultural economy. They prey heavily on sheep and calves and are carriers of rabies.
5. Recommendation on Mule Deer Herd: Consideration should be given to the encouragement of the growth of a small herd of mule deer in westcentral Lea County which could be used for hunting.

The Lea County Planning and Zoning Board has no plans for expanding this report at present.

THE EDDY COUNTY LAND USE PLAN was written in 1977 by the Eddy County Land Use Planning Commission. They did not make any recommendations, but merely stated the present situation concerning the varied resources. Two of the problems they discuss are:

1. That the high percentage of publicly-owned lands has a significant impact on the county. Ranchers having grazing leases on these lands are less likely to implement large-scale range improvement programs than if they owned these lands. The lack of privately-owned land also substantially decreases the

potential property tax base of the county. The proximity of Bureau of Land Management lands to the east and west of Carlsbad will probably have a long-term effect on that city's direction of growth, especially if the city experiences a significant population increase.

2. Saltcedar infestation is a serious problem along the Pecos River and its tributaries. These phreatophytes, which consume large amounts of water, spread rapidly. They are difficult to control, as their roots can extend to 30 feet underground. The Bureau of Reclamation's PECOS RIVER WATER SALVAGE PROJECT has cleared and is maintaining 54,000 acres along the Pecos River between Fort Sumner, New Mexico, and Pecos, Texas. There are also tens of thousands of other infested acres along the Pecos and its tributaries. The Bureau's long-range plans are to extend its water salvage program into these other areas.

THE EDDY COUNTY LAND USE PLAN is not yet approved. The county has no plans to enlarge the scope of the plan or make any recommendations.

THE CHAVES COUNTY COMPREHENSIVE LAND USE PLANNING AND ZONING REPORT was completed in February 1973 by the Chaves County Commission. It made the following recommendations:

1. Watershed Protection and Improvement: Encourage small erosion control structures, in conjunction with range management, to reduce the sediment load presently going into the Pecos River.
2. Livestock Grazing: Encourage good range management practices to increase livestock production and improve vegetative cover for watershed protection.
3. Wildlife Habitat: Produce, through good range management, the kind of habitat required by the lesser prairie chicken and most other wildlife species. Water is a critical wildlife need and provisions for wildlife waters should be encouraged along with livestock water developments.
4. Brush Control: Achieve maximum rangeland vegetation through brush control, which is an essential component of intelligent land management.
5. All Other Uses: Confine vehicle use to existing roads and trails as much as possible.
6. Health: Carefully monitor water supplies for contamination by pesticides, chemicals, and other waste products.

The Commission is currently planning zoning to go with this report.

The Southeast New Mexico Economic Development District (SENMEDD) is a major planning agency in the ES area. Their area of responsibility is Chaves, Eddy, Lea, Lincoln, and Otero Counties. While they concern themselves primarily with community planning, some of their plans would affect items considered in the ES. These items are:

In SENMEDD's COMPREHENSIVE ECONOMIC DEVELOPMENT STRATEGY, there is a map which outlines various land uses in the ES area. Among other things, it shows: Oil - gas producing area - over half of ES area;

Potash producing area - area east of Carlsbad; Urban development - around Lovington and Hobbs; Rural development - around smaller towns, Avalon Lake and between Lovington and Hobbs; Intensive agricultural development - East of Lovington, Hobbs, and Tatum; Conservation and open space reserves - Mescalero Sands and the Pecos River Riparian Zone.

SENMEDD is continually planning or coordinating their plans.

The Sureste Resource Conservation and Development Project (RC&D) has published a PROGRAM OF ACTION. It lists a number of opportunities. Those that may affect the east Roswell ES effort are:

OPPORTUNITIES: Land

1. Revamp land ownership patterns of public and private lands through land exchange programs.
2. Encourage and support land use planning by maintaining close relations with governing bodies and decision makers and by providing them resource data for local planning.
3. Accelerate wildlife habitat preservation and development.
4. Encourage and support legislation giving federal and state agencies administering the use of public lands the ability to properly manage and improve for the future the public lands for which they are responsible.

OPPORTUNITIES - Rangeland:

1. Support coordinated planning efforts among ranchers, grazing associations, SCS, BLM, USFS, and State Land Office. All Natural Resource Conservation District Boards should take leadership actions to initiate and implement coordinated rangeland planning efforts with individual ranchers and grazing associations where any combination of private, state, and federal land ownership is involved. Agency savings can be effected by working with groups and by preventing duplication of effort. Savings to ranchers will also result from simultaneous treatment of common problems.
2. Promote the installation of properly planned grazing systems which provide periodic rest to different pastures or units during the critical growing season of key forage plants. Planned grazing systems applied in conjunction with other proven management practices, such as proper grazing use, deferment, salting, feeding, and herding, can significantly accelerate range improvement.
3. When feasible, encourage the planning of management units and fences so that these boundaries coincide with soil boundaries providing optimum management of vegetation and watershed.
4. Encourage the installation of structural practices such as fencing, livestock water development and distribution systems, erosion control structures, rangeland mechanical treatment,

livestock handling facilities, utility roads, and stock trails to facilitate management practices.

5. Accelerate the management of brush in patterns designed to increase forage production, benefit wildlife, enhance natural beauty, and recreation.
6. Provide more drinking water for livestock and wildlife. Includes wells, storage facilities, pipelines, springs, troughs, raintraps (water catchments), and earthen tanks. Optimum water distribution would put grazeable forage areas a mile or less from water, depending on terrain.
7. Promote range seeding on deteriorated rangeland and on dry cropland to be converted. Priorities should be given to soils with the highest production capabilities. Cool season plants which will provide green forage in spring and fall should be considered for seeding these areas.
8. In addition to implementation of existing technology, a continuing need exists for range research.
9. Encourage the planting of more crops on irrigated lands which can be used during the winter for livestock grazing.

OPPORTUNITIES: WATER

1. Promote improvement of rangeland hydrology through conservation measures and management systems to slow run-off, reduce erosion, sedimentation, flooding, and pollution.
2. Accelerate conservation measures to control floodwater run-off, reduce erosion, sedimentation, and flooding.
3. Accelerate phreatophyte control to reduce water loss and conversion of cleared lands to become well-vegetated beneficial rangelands or croplands.

The Sureste RC & D updates its PROGRAM OF ACTION annually. The Soil Conservation Service does some planning on a ranch-by-ranch basis. These usually attempt to implement good range management practice and are known as Ranch Management Plans or Great Plains contracts, depending upon the circumstances.

The New Mexico State Planning Bureau has a statewide planning effort being completed at present. It is similar to BLM's URA Steps 2 and 3 in that it addresses the physical profile and present situation. They make no decisions, simply using this data in planning various projects.

Also, most larger cities also have planning and zoning commissions. These are not usually affected by public land management.

COORDINATION IN THE REVIEW OF THE DRAFT ENVIRONMENTAL STATEMENT

Comments on the draft environmental statement were requested from the following agencies and interest groups. Asterisks denote those providing comments.

CONGRESSIONAL DELEGATION, NEW MEXICO

Senator Pete Domenici*
Senator Harrison Schmidt*
Representative Harold Runnels*

FEDERAL AGENCIES

- Advisory Council on Historic Preservation*
- Department of Agriculture
  - Forest Service
  - Soil Conservation Service*
  - Agricultural Stabilization and Conservation Service
- Department of the Army
  - Army Corps of Engineers*
- Department of the Interior
  - U. S. Fish and Wildlife Service*
  - Bureau of Reclamation*
  - Heritage Conservation Recreation Service*
  - U. S. Geological Survey*
  - Bureau of Mines
  - National Park Service*
  - Bureau of Indian Affairs*
- Department of State
- Environmental Protection Agency*

STATE AGENCIES

Office of the Governor*
New Mexico Farm and Livestock Bureau
New Mexico State Clearinghouse*
Game and Fish Department*
State Engineer
State Historic Preservation Officer*
State Land Office
State Planning Office
Environmental Improvement Agency
New Mexico State University*
Eastern New Mexico University
University of New Mexico
State Highway Department

REGIONAL AND LOCAL AGENCIES

Southeast New Mexico Economic Development Commission
Eastern Plains Council of Governments
Chaves County Planning and Zoning Commission
Eddy County Planning and Zoning Commission
Lea County Planning and Zoning Commission
Sureste Resource Conservation and Development Project
Llano Estacado Resource Conservation and Development Project*
South-central Mountain Resource Conservation and Development Project
Artesia Chamber of Commerce
Carlsbad Department of Development
Hobbs City Manager
Roswell Chamber of Development and Commerce*
Mayor, City of Roswell
Mayor, City of Artesia*
Mayor, City of Carlsbad*
Mayor, City of Hobbs
Mayor, City of Lovington
Mayor, City of Tatum
Mayor, City of Jal
Mayor, City of Eunice
Chaves County Commissioners*
Lea County Commissioners
Eddy County Commissioners*

CONSERVATION ORGANIZATIONS

Ada County Fish and Game League
New Mexico Conservation Coordination Council
Sierra Club*
New Mexico Wildlife Federation
National Wildlife Federation
National Council of Public Land Users
Natural Resources Defense Council
Wildlife Management Institute*
Central New Mexico Audubon Society
Wilderness Society
Friends of the Earth
Oregon Environmental Council
Southeastern New Mexico Audubon Society
Carlsbad Sportsman's Club
Chaves County Wildlife Federation
Nevada Outdoor Recreation Association
Public Lands Council

LIVESTOCK ORGANIZATIONS

Southeastern New Mexico Livestock Grazing Association*
New Mexico Cattle Growers' Association*

Jal Grazing Association
New Mexico Cattlemen's Association
New Mexico Wool Growers' Association*
Southeast Lea County Fee Landowners' Association

PROFESSIONAL SOCIETIES

Society for Range Management
Soil Conservation Society of America
Wildlife Society
Ecological Society

OTHER AGENCIES

Texas Tech University
Southwest Research and Development Company
Pennsylvania Cooperative Wildlife Research Unit
New Mexico Oil and Gas Association
Yates Petroleum Corporation
Mississippi Chemical Corporation

PUBLIC REVIEW AND HEARINGS

The draft Environmental Statement (DES) was filed with the Environmental Protection Agency and made available to the public on June 6, 1979. The notice of availability was published in the June 11, 1979, Federal Register (Vol. 44, No. 113, page 33498). The notice announced a 45-day public review period ending July 30, 1979. The public review period was scheduled to provide concerned agencies and the public an opportunity to review the DES and to offer comments on the adequacy of the draft statement and the environmental impacts of the proposed action.

After publication of the notice of availability, over 600 copies of the DES were distributed to reviewing agencies and to interested members of the general public, with a cover letter summarizing the proposed action and announcing the time and locations of the scheduled public hearings. Copies of the DES were also made available to the public in several public libraries and at the Bureau of Land Management Offices in New Mexico as well as the BLM Office of Public Affairs in Washington, D. C. A news release was mailed from the BLM New Mexico State Office to radio and television stations, newspapers, and interest groups throughout the state.

Two public meetings were held during the public review period: one in Roswell on July 17, 1979, and one in Carlsbad on July 18, 1979. BLM's Associate State Director for New Mexico, Larry Woodard, presided over both hearings. Over 300 people attended these hearings and 32 individuals testified. A court reporter was present at both hearings to record the verbatim transcripts.

During the public review period, approximately 155 comment letters were received. Each letter was properly recorded on the day that it was received and numbered consecutively.

Each letter was reviewed to determine if it met the criteria required for response in the final environmental statement, i.e.: those which discussed the adequacy of the DES. Comments which presented new data, questioned facts and/or analyses, or commented on the issues bearing directly on the DES or the environmental impacts of the proposed action were fully evaluated and responded to. Resultant changes or additions to the text of the DES have been incorporated into this final statement.

Table 9-1 lists each letter and its assigned control number. Those letters which did not comment on the adequacy of the DES are designated by "no response needed" on Table 9-1. These letters are not included in this section; however, these letters will be considered in the decision-making process, and answered by individual letter.

The following section contains those letters which have substantive comments concerning the adequacy of the DES. Comments are keyed to the control number of the letter in which they appeared (comment 10-3 is the third comment in letter No. 10). The responses to specific comments follow the appropriate comment letter. In some cases, responses go beyond the scope of the specific comment, in order to adequately cover other related comments and to maximize the cross-referencing of responses. The letters are followed by those comments received at the public hearings. In some cases, the same person submitted comments by letter in addition to making an oral presentation at the public hearings. In these cases, comments are only addressed in the letter section.

All comment letters and transcripts of the two public hearings are on file in the Roswell District Office and are available for review.

TABLE 9-1
INDEX OF PUBLIC COMMENTS

Letter No.	Respondent	DATE RECEIVED	NO RESPONSE NEEDED	VEGETATION AND/OR RANGE SURVEY	THREATENED OR ENDANGERED PLANTS	SOILS	AIR QUALITY	WATER USE	WILDLIFE	THREATENED, ENDANGERED, OR PROTECTED WILDLIFE	CULTURAL RESOURCES	VISUAL RESOURCES	RECREATION	WILDERNESS	LIVESTOCK GRAZING	SOCIAL CONDITIONS	ECONOMIC CONDITIONS	EDITORIAL	GEOLOGY, OIL & GAS	REGULATIONS, LAWS, POLICIES		
1	Paul Bond	6/19/79	X																			
2	Advisory Council on Hist. Places	6/20/79									X											
3	Lois Jean Wiggins	6/25/79	X																			
4	Audrey Reid	6/25/79	X																			
5	State Historic Pres. Officer	6/26/79									X											
6	U.S.G.S.	7/2/79							X										X			
7	Blaine Haines	7/7/79		X																		
8	Nat. Park Service, S.W. Region	7/10/79	X																			
9	Frates Seeligson	7/5/79	X																			
10	Wildlife Mgmt. Institute	7/9/79							X													
*11	E.P.A.	7/9/79	X																			
12	Jesse F. Rayroux	7/12/79		X																		
13	Ray Sharbutt	7/17/79		X											X							
14	Congressman Runnels	7/16/79													X					X		
15	Kathy Berry	7/20/79	X																			
16	J. T. McAdams	7/16/79	X																			
17	Calvin B. Smith	7/23/79							X													
18	James A. Funk	7/23/79	X																			
19	Buck Valentine	7/23/79	X																			
20	Dan E. Davis	7/23/79	X																			
21	W. E. Corn	7/23/79	X																			
22	Lois Clayton	7/23/79		X																		
23	Evelyn Williams	7/23/79	X																			
24	Joe A. Mims	7/23/79	X																			
25	State of N.M., Nat. Res. Dept.	7/23/79							X													
26	D. F. Lewis	7/23/79	X																			
27	Senator Pete Domenici	7/23/79		X																X		
28	Syble Corn	7/23/79	X																			
29	Mark Draper	7/23/79	X																			
30	Johnny Casabonne	7/24/79		X																		
31	Caprock Ranch (W.D. Sterrett)	7/24/79	X																			
32	Anthony E. Treat	7/24/79	X																			
33	Don Merritt	7/24/79	X																			
34	Margaret Merritt	7/24/79	X																			
35	W. B. McCombs	7/24/79	X																			
36	Glenn Stevenson	7/24/79	X																			
37	Gerry Smith, Jr.	7/24/79	X																			
38	F. J. Smith	7/24/79	X																			
39	Pat Sims	7/24/79	X																			
40	Town of Dexter	7/24/79	X																			
41	Wm. Heinold	7/24/79	X																			
42	Janet Jaquess	7/24/79	X																			
43	Evelyn & Melvin Key	7/24/79	X																			
44	Lewis P. Means	7/24/79	X																			
45	W. R. & Maggie Joy	7/24/79	X																			
46	Laurie Kincaid	7/24/79		X																		
47	Marvin Byrd	7/24/79	X																			
48	Mr. & Mrs. Alton Corn	7/25/79	X																			
49	James I. Grassie	7/25/79	X																			
50	Water Resources Div.	7/25/79	X																			
51	Cindy Key	7/25/79		X																		
52	Cindy Key & Others (Petition)	7/25/79	X																			
53	Linda Casabonne Bowman	7/26/79	X																			
54	Mike Corn	7/26/79	X																			
55	J. C. Tulk	7/26/79	X																			
56	W. F. Brainard	7/26/79														X	X					
57	Ronald Merritt	7/26/79	X																			
58	Henry Townsend	7/26/79													X							
59	Inez Crockett	7/26/79	X																			
60	Clarence & Ellen McDonald	7/27/79		X											X	X	X					
61	Frances Smith	7/27/79	X																			
62	N.M.S.U., Dept. of Fishery & Wildlife	7/27/79		X					X													
63	Bonnie Powell	7/27/79	X																			
64	William C. Smith	7/27/79		X											X					X		
65	David Carpenter	7/27/79		X																		
66	Anette Carpenter	7/27/79		X																		
67	Snyder Ranches	7/27/79	X																			
68	N.M. Soil & Water Cons. Dist.	7/27/79	X																			
69	Hezzie Powell	7/27/79	X																			
70	Malcolm Madera	7/27/79		X																		
71	J. M. Fields	7/27/79	X																			
72	Roswell State Bank	7/27/79	X																			
73	Steve Berry	7/27/79	X																			
74	C. Stuart Moats	7/27/79																		X		

*Though no response is required, this letter is included to show compliance with E.P.A. requirements.

TABLE 9-1
INDEX OF PUBLIC COMMENTS

2

Letter No.	Respondent	DATE RECEIVED	NO RESPONSE NEEDED	VEGETATION AND/OR RANGE SURVEY	THREATENED OR ENDANGERED PLANTS	SOILS	AIR QUALITY	WATER USE	WILDLIFE	THREATENED, ENDANGERED, OR PROTECTED WILDLIFE	CULTURAL RESOURCES	VISUAL RESOURCES	RECREATION	WILDERNESS	LIVESTOCK GRAZING	SOCIAL CONDITIONS	ECONOMIC CONDITIONS	EDITORIAL	GEOLOGY, OIL & GAS	REGULATIONS, LAWS, POLICIES		
75	Larry Christesson	7/27/79	X																			
76	D.O.A., Army Corp. of Engineers	7/27/79		X																		
77	Sand Ranch	7/27/79		X																		
78	NMSU, RI Task Force	7/30/79		X		X		X	X						X	X	X	X		X		
79	Paul Bond	7/30/79	X																			
80	U.S.D.I., Hert. Cons. & Rec. Serv.	7/30/79									X											
81	Lovelace Livestock Co.	7/30/79	X																			
82	Alvin Kincaid	7/30/79		X												X	X			X		
83	Malcolm McCarty	7/30/79		X																		
84	Kap Kelley	7/30/79	X																			
85	David Sorenson	7/30/79																X				
86	N. M. Dept. of Ag.	7/30/79		X					X							X	X			X		
87	James Childress	7/30/79														X	X					
88	S.C.S.	7/30/79		X		X			X							X	X					
89	E. N. Benedict	7/30/79	X																			
90	Jeff Robbins	7/30/79	X																			
91	Ruth Robbins	7/30/79	X																			
92	Ben Robbins	7/30/79	X																			
93	Willie McInnes	7/30/79	X																			
94	Charles R. Martin	7/30/79		X																		
95	Bonita Ward Birmingham	7/30/79	X																			
96	J. C. Ward, Jr.	7/30/79	X																			
97	W. J. Ball	7/30/79	X																			
98	David Glass	7/30/79	X																			
99	El Llano Estacado RC&D	7/30/79																		X		
100	Slash ML Ranch, Inc.	7/30/79		X																		
101	Tom & Bettie Corn	7/30/79	X																			
102	Frances Netherlin	7/30/79	X																			
103	G. I. Johnson	7/30/79	X																			
104	D. C. & Philip Berry	7/30/79		X																		
105	Lea McDonald	7/30/79	X																			
106	Lewis Derrick	7/30/79	X																			
107	Mr. & Mrs. Ralph Schafer	7/30/79	X																			
108	Nona L. Snow	7/30/79	X																			
109	Lloyd Treat	7/30/79	X																			
110	L. S. Williams, Jr.	7/30/79	X																			
111	State of New Mexico, E.I.D.	7/30/79						X	X													
112	David T. McCrea	7/31/79		X																		
113	James Gist	7/31/79	X																			
114	Vivian Laxson	7/31/79		X																		
115	Sammy Clark	7/31/79	X																			
116	Roswell Chamber of D & C	7/31/79	X																			
117	Ernest Harwell	7/31/79														X	X					
118	Penasco Soil & Water Cons. Dist.	7/31/79	X																			
119	Sam Elkins	7/31/79	X																			
120	Richard Corn	7/31/79	X																			
121	Snyder Ranches	7/31/79	X																			
122	David Kincaid	7/31/79		X																		
123	George Casabonne	7/31/79		X																		
124	Mr. and Mrs. George Greenwood	7/31/79		X																		
125	Nona L. Snow	7/31/79	X																			
126	Hugh Kincaid	7/31/79		X																X		
	LETTERS RECEIVED AFTER THE COMMENT PERIOD BUT STILL CONSIDERED IN THE FINAL ENVIRONMENTAL STATEMENT																					
127	Roosevelt Natural Resource Cons. Dist.	8/1/79																		X		
128	Caswell Ranch	8/1/79	X																			
129	Chaves Soil/Water Cons. Dist.	8/1/79	X																			
130	Chaves County Ag. Council	8/1/79		X																		
131	Rio Grande Chapter, Sierra Club	8/1/79		X					X													
132	O. C. Malstrom	8/1/79	X																			
133	Lonnie & Pauline Harper	8/1/79		X																		
134	Scott McNally	8/1/79		X																		
135	W. D. Dinwiddie	8/1/79	X																			
136	Paul Creek	8/1/79		X																		
137	Monty Beckam	8/1/79	X																			
138	M. McCarty	8/1/79		X																		
139	Wayne Boles	8/1/79		X																		
140	Bill Grassie	8/1/79	X																			
141	Della Greenwood	8/1/79							X													
142	Carl Johnson	8/1/79	X																			
143	Dewey Stokes	8/1/79		X																		
144	Bert Madera	8/1/79	X																			
145	Truman Pierce	8/1/79		X																		

Letter No.	Respondent	DATE RECEIVED	NO RESPONSE NEEDED	VEGETATION AND/OR RANGE SURVEY	THREATENED OR ENDANGERED PLANTS	SOILS	AIR QUALITY	WATER USE	WILDLIFE	THREATENED, ENDANGERED, OR PROTECTED WILDLIFE	CULTURAL RESOURCES	VISUAL RESOURCES	RECREATION	WILDERNESS	LIVESTOCK GRAZING	SOCIAL CONDITIONS	ECONOMIC CONDITIONS	EDITORIAL	GEOLOGY, OIL & GAS	REGULATIONS, LAWS, POLICIES		
146	Bureau of Indian Affairs	8/1/79	X																			
147	N.M. Dept. of Game & Fish	8/1/79							X													
148	Mark Cooper	8/1/79	X																			
149	City of Artesia	8/1/79	X																			
150	Bureau of Reclamation	8/1/79		X																		
151	Max Stevenson	8/6/79	X																			
152	U. S. Fish and Wildlife Service	8/13/79		X					X	X												
153	New Mexico State University (follows No. 78)	8/13/79							X													
154	N. M. Soil and Water Conservation District	8/17/79		X											X					X		
155	N. M. Association of Conservation Districts	8/17/79		X											X					X		

Advisory
Council On
Historic
Preservation

1522 K Street NW.
Washington D.C.
20005

Reply to: P. O. Box 25085
Denver, Colorado 80225

2

June 18, 1979

Mr. Tom Kiddoo
Public Affairs Specialist
Roswell District
Bureau of Land Management
P. O. Box 1397
Roswell, New Mexico 88201

Dear Mr. Kiddoo:

This is to acknowledge receipt of the draft environmental statement for grazing management in the East Roswell area of southeastern New Mexico, on June 18, 1979. We regret that we will be unable to review and comment on this document in a timely manner pursuant to Section 102(2)(C) of the National Environmental Policy Act of 1969.

2-1 Nevertheless, the Bureau of Land Management is reminded that, if the proposed undertaking will affect properties included in or eligible for inclusion in the National Register of Historic Places, it is required by Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. Sec. 470f, as amended, 90 Stat. 1320) to afford the Council an opportunity to comment on the undertaking prior to the approval of the expenditure of any Federal funds or prior to the issuance of any license. The Council's regulations, "Protection of Historic and Cultural Properties" (36 CFR Part 800.4) detail the steps an agency is to follow in requesting Council comment.

Generally, the Council considers environmental evaluations to be adequate when they contain evidence of compliance with Section 106 of the National Historic Preservation Act, as amended. The environmental documentation must demonstrate that either of the following conditions exists:

Response 2-1

This environmental statement would be considered under the provisions of the Draft Programmatic Memorandum of Agreement among the Department of the Interior, Bureau of Land Management and the Advisory Council on Historic Preservation and the National Conference of State Historic Preservation Officers regarding the Livestock Grazing and Range Improvement Program. The memorandum has been signed by the Deputy Executive Director of The Council and forwarded to the other signatories. We espect that the agreement will be ratified and in effect by the time the management program is initiated.

We have met the required stipulations for grazing statements, thereby, meeting our responsibilities under Section 106 of the National Historic Preservation Act.

The Roswell District, Bureau of Land Management is in the process of conducting a Class I inventory of the district. The final copy of the report is expected in October, 1979. No Class II surveys were conducted for this ES. The decision was made to use existing information.

The Class I survey and the Planning Units from which the information within the ES was drawn are referenced in the ES.

Record of submission of site descriptions to the Keeper of the Record for determination of eligibility is shown in Appendix 5.

As stated in the Standard Operating Procedures of Chapter 1, pp. 1-27 thru 1-30, prior to the implementation of range projects, a Class III cultural resource inventory of the specific area will be conducted.

As stipulated in the memorandum of understanding between the State of New Mexico (SHPO) and the Bureau of Land Management (NMSO) Memorandum of Understanding #NMSO-97, the Roswell District BLM provides and will continue to provide the SHPO with copies of cultural resource inventories.

As stated in the Standard Operating Procedure of Chapter 1, pp. 1-27 thru 1-30, range projects are designed to avoid adverse effects on cultural resource properties. This will be accomplished by either avoiding the site or by undertaking appropriate mitigation measures.

The effects of the proposed action on properties included in the National Register are shown in Chapter 3 of this document.

A letter from the State Historic preservation officer commenting on the effects of proposed action on cultural resources is included in Appendix 5.

Page 2
Mr. Tom Kiddoo
Grazing Management in the East Roswell Area
June 18, 1979

1. 'No properties included in or that may be eligible for inclusion in the National Register are located within the area of environmental impact, and the undertaking will not affect any such property. In making this determination, the Council requires: 2-1 cont.

--evidence that the agency has consulted the latest edition of the National Register (Federal Register, February 6, 1979, and its monthly supplements);

--evidence of an effort to ensure the identification of properties eligible for inclusion in the National Register, including evidence of contact with the State Historic Preservation Officer, whose comments should be included in the final environmental statement.

2. Properties included in or that may be eligible for inclusion in the National Register are located within the area of environmental impact, and the undertaking will or will not affect any such property. In cases where there will be an effect, the final environmental statement should contain evidence of compliance with Section 106 of the National Historic Preservation Act through the Council's regulations, "Protection of Historic and Cultural Properties".

Should you have any questions, please call Jane King at (303) 234-4946, an FTS number.

Sincerely,

Louis S. Wall
Chief, Western Office
of Review and Compliance

STATE OF NEW MEXICO
EDUCATIONAL FINANCE AND CULTURAL AFFAIRS DEPARTMENT
HISTORIC PRESERVATION PROGRAM
SANTA FE
87503

P.O. BOX 1629

AREA CODE 505
TELEPHONE 827-2108

5

June 25, 1979

Mr. Tom Kiddoo
Public Affairs Specialist
Roswell District
Bureau of Land Management
P. O. Box 1397
Roswell, New Mexico 88201

Dear Mr. Kiddoo:

Thank you for the opportunity to comment on the Draft Environmental Statement on grazing management in the East Roswell area.

Major direct and indirect impacts are identified in the statement (p. 3-48).

5-1 The statement does not adequately describe nor assess cultural resources in the area of effect. The sites discussed on pp. E1-E5 are only a small fraction of those in the area, nor is the documentation of a majority of the identified sites adequate. My letter of November 29, 1978 points out some deficiencies. No survey was performed in support of this environmental statement; the available site information is from a variety of sources.

The Class I Survey Overview will no doubt provide a better general picture of the site population, and a better set of suggestions for future research, than has existed up to now.

However the gaps in our knowledge of cultural resources in this area can only be dealt with by project-specific surveys and mitigation or preferably, avoidance procedures.

I will be happy to take part in 36 CFR 800 procedures specific to brush control activities, facilities, construction, and other actions which may affect cultural resources. This sort of review is pretty much a continuous process. We work in the same way with the Albuquerque District.

I am looking forward to working with your office as circumstances require.

Sincerely,

for Thomas W. Merlan
State Historic
Preservation Officer

TWM:mk

Response 5-1

The ES is based upon existing information from various sources including amateurs and professionals. The quality and quantity of data concerning these sites varies tremendously. Again, because existing data is used, not enough information is available to adequately assess the significance of many of these sites. Some of this information problem will be solved through the use of standard operating procedures. Prior to the installation of range improvements, an archeological survey will be conducted of that area. Following this survey, a more adequate assessment of the impact of the project on the specific cultural resource site can be made. Coordination with the State Historic Preservation Officer will be a continuing process as projects are defined and sites are more accurately identified.

United States Department of the Interior

GEOLOGICAL SURVEY
Conservation Division
P. O. Box 26124
Albuquerque, New Mexico 87125

6

JUN 2 9 1979

Memorandum

To: Public Affairs Specialist, BLM, Roswell

From: Environmental Scientist, Albuquerque

Subject: Comments on East Roswell Grazing Environmental Statement Draft, Re: 1792

Thank you for sending us a copy of the subject DEIS and for the opportunity to make our comments. It seems that the grazing program would have no significant impact on Federal oil and gas operations; however, we offer the following general comments:

6-1 1) There is no mention of the use of public land in Southeast New Mexico by oil and gas operations. The future development of Federal oil and gas leases will remove a significant amount of acreage from grazing use. Drill pads and access roads would exclude other uses of the land from the time of construction through the life of the well until the end of surface rehabilitation. The acreage involved could be from one to three acres per well. The mention of oil and gas leasing would be an appropriate topic for the section on interrelationships beginning on page 1-32 of the DEIS.

6-2 2) Map 1-1, page 1-22: This map shows the critical habitat of the Lesser Prairie Chicken to exist only in Chaves County. A large area in Northern Lea County and a smaller one south-southeast of Hobbs are also a part of this habitat and should be shown on the map.

Gary Stephens

GARY STEPHENS

ONE HUNDRED YEARS OF EARTH SCIENCE IN THE PUBLIC SERVICE

Response 6-1

The present and future impact of oil and gas leasing on the amount of acreage available for livestock grazing was not addressed in the Grazing Environmental Statement because such leasing is not involved in the proposed action.

Although acreage is being removed from grazing for oil and gas development, acreage is also being constantly returned to forage productivity as wells are abandoned and reclaimed. The actual acreage loss at this time is unknown.

Response 6-2

The BLM is aware of these areas. However, since there is very little public land involved, BLM would not control management practices that would affect the non-federal lands. The New Mexico Department of Game and Fish is studying lesser prairie chickens in these areas and are in the position to handle any management problems which might arise.

Artesia, N. Mex
June 30, 1979

James H O'Connor
Bureau Land Management
Box 1397
Roswell, N. M. 88201

Dear Mr. O'Connor:

I want you to know that I protest the East Roswell Grazing Environmental Statement.

7-1 There was only one study made and it happened to be dry at that particular time, so the allotment was cut. There should have been several studies made before the allotment was even adjusted.

Sincerely,
Blaine Haines

Response 7-1

The final ES has been changed to more clearly indicate the method of verifying the range survey's accuracy. This additional information was included on page A-8 of the ES. In essence this additional information points out that, in addition to the initial survey conducted in 1977, a check of each transect was made during the spring of 1978 to determine if surveyed results were reasonable for the sites. As a result of these checks, two thirds of the transects were rerun during the fall of 1978. Approximately one third of the original transects contained errors and the other third was resampled for correlation purposes to determine if significant differences occurred between the samples taken in 1977 and those that were taken in 1978. There was a strong correlation. The reason for this correlation, even though rainfall amounts varied between the two years, was that the procedure used in the survey allowed for growth that would normally be expected to take place on the plant species encountered regardless of the rainfall rather than only that amount of production which had occurred at the time of survey. This technique also includes the amount of production which may have been utilized by grazing animals at the time of survey. The information derived from the survey is only intended to be used as a starting point for livestock adjustment.

Determination of the ultimate stocking rates for the range lands would be based on further studies. The establishment of permanent studies to determine year to year utilization is presently underway. The results of these studies along with information concerning actual livestock use will modify the stocking rate which was determined from the survey, if a difference is indicated. Grazing use would be increased as additional forage for livestock becomes available. The only way that the range survey would set the stocking rate for the next twenty years would be if no further information were gathered which would indicate a stocking rate difference than that determined by the survey. All forage plants were considered, including mesquite and shinnery oak, in the range survey procedure. The only exception was for those annual forbs and annual grasses which were not used to determine base stocking rates. The presence of these forbs and grasses on the range in favorable years can provide additional forage for grazing use which exceeds the base stocking rate. This use can be handled through the issuance of temporary non-renewable licenses to cover the period when these plants are available.

Wildlife Management Institute 10

709 Wire Building, 1000 Vermont Ave., N.W., Washington, D.C. 20005 • 202 / 347-1774

DANIEL A. POOLE
President
L. R. JAHN
Vice-President
L. L. WILLIAMSON
Secretary
JACK S. PARKER
Board Chairman

July 6, 1979

Mr. Tom Kiddoo
Public Affairs Specialist
Roswell District
Bureau of Land Management
Post Office Box 1397
Roswell, New Mexico 88201

Dear Mr. Kiddoo:

The Wildlife Management Institute is pleased to comment on EAST ROSWELL DRAFT GRAZING ENVIRONMENTAL STATEMENT, New Mexico.

The statement has several omissions that must be overcome. Changes in emphasis also are needed to make the plan satisfactory for wildlife.

10-1 AUM's allocated for wildlife are very small. We appreciate that these are based on present big game populations. However, the report does not address quality of forage for big game. This is a serious weakness because cattle graze year long and by their sheer weight of numbers have first chance at the more palatable plants and portions of plants. We believe expansion of big game numbers could be speeded by a greater forage allocation now on appropriate portions of the planning unit.

10-2 The agreement with the New Mexico Department of Game and Fish (p.1-34) needs emphasis, particularly in the Forage Allocation sections and tables. This agreement provides for an increase in wildlife AUM's as wildlife populations increase. However, can they increase in a timely manner without the forage available ahead of time?

The proposal to fence 17 groves of trees is very good. Table 6-1 (p. 6-5) shows that 65 groves will eventually die out. Diversity will be improved if substantially more than 17 are fenced.

10-3 The large livestock exclosures for prairie chickens are good as are the smaller 10-20 acre exclosures (p. 4-1). For wildlife diversity and enhancement, there should be substantial expansion of this program.

10-4 Specific provisions and methods of monitoring vegetative responses on riparian and wetland areas (#3, p. 1-29) should be stated in the monitoring paragraphs starting on p. 1-31.

Response 10-1

The ES does discuss the quality of forage for mule deer on page 2-21. It is pointed out that "Browse on semidesert rangeland is deficient in phosphorus and of low quality. This deficiency affects growth, reproduction, and well-being of mule deer using this habitat (Church 1971, Short 1977)," also "Mule deer in shinnery oak habitats appear heavier-bodied with broader and larger antlers. This is probably due to the better nutritional value of acorns (Duvendeck, 1962)." Forage quality for antelope is addressed on page 2-22 where the importance of forbs and browse is also discussed. Although a specific statement is not made concerning quality, it is widely recognized that antelope ranges must have abundant supplies for forbs and other succulents (New Mexico Interagency Range Committee, 1971).

Concerning yearlong cattle grazing and expansion of big game numbers, page 2-21 points out competition problems between cattle and mule deer. Even though yearlong grazing is still a viable grazing system at light to moderate levels, it does not apply to occupied mule deer range where rest periods are required to meet the phenological needs of four-wing saltbush and other plants. The impact analysis shows that mule deer herds will increase by the year 2000, but only slightly. Limiting factors appear to be the general poor quality of forage and a lack of suitable terrain for cover. Page 3-35 points out that antelope are not expected to increase due to energy exploration activities and poaching.

Response 10-2

Increased forage allocations would not result in an increase in big game populations in the ES area. Forage quality is generally poor for mule deer. Rest periods would improve that situation so that some portion of the range normally utilized by deer herds would always have periods of non-use.

The 200 animal increase would be due to a combination of factors: forage allocations for present numbers, removal of livestock from unsuitable areas (where many deer are located), and water development in suitable but unoccupied habitat.

Response 10-3

Expansion of this program is desirable from a wildlife habitat standpoint and is discussed under alternative no. 6, "Enhancement of Other Resource Values." The multiple-use recommendation resulting from the Bureau Planning System did not provide for expansion of the program and, therefore, it is not included in the proposed action. In making the final management decision, the District Manager has the option of expanding the program, if impacts identified in the grazing effects portion of this document and on other factors indicated that such action is warranted.

Response 10-4

Effects of livestock grazing on riparian and wetland areas would not be monitored since the proposal states that "where conflicts exist between cattle and aquatic habitat, complete protection through fencing is planned." Upland playas on public land have total protection proposed and areas along the Pecos River would receive protection, if the determination is made that grazing is having a negative impact.

10-5 Fencing of 32 tanks and 7 playas is good. This program also needs expansion to many of the other 164 tanks that will continue to deteriorate (p. 6-1).

10-6 No mention is made of the NMDGF water developments on the area. It is our understanding there are a number of these.

A definite goal of increasing vegetative diversity should be developed for the unit. This plan provides an opportunity to accomplish such a goal and improve overall wildlife habitat diversity of both the original grassland and the present brush-dominated vegetation.

10-7 We do not understand why the exclosures (p. A-47) and the same exclosures called excluded lands (p. A-46) will not increase in forage production above 870 AUM's.

10-8 Coordination with NMDGF should be emphasized. It is our understanding that the agency's personnel participated in the plan and provided data more than is indicated.

These remarks have been coordinated with William B. Morse, the Institute's Western Representative.

Sincerely,

Daniel A Poole

Daniel A. Poole
President

DAP:lbb

Response 10-5

See Response 10-3.

Response 10-6

The proposed action would not affect water developments of the Department of Game and Fish, nor do the presence of these developments affect any aspects of the proposed action. These water catchments were designed to provide water primarily for quail.

Response 10-7

In the exclosures or on excluded lands, it is anticipated that brush invasions will continue to expand, based on the discussions under Vegetation in Chapter 3. Therefore, after several years, exclusion from livestock grazing may even result in decreased production because of a loss in the vigor of grass species.

Response 10-8

All information obtained from NMDG&F which was pertinent to the ES has been noted and cited in the text. This included: big game numbers, harvests, and ranges; hunter use statistics; endangered species; and furbearer information.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI
1201 ELM STREET
DALLAS, TEXAS 75270

11

June 29, 1979

Mr. James H. O'Connor
District Manager
U.S. Department of Interior
Bureau of Land Management
P.O. Box 1397
Roswell, New Mexico 88201

Dear Mr. O'Connor:

We have completed our review of the Draft Environmental Impact Statement (DEIS) on the proposed Bureau of Land Management's Roswell District Grazing Management Program for Chaves, Eddy and Lea Counties, New Mexico. The purpose of this program will be to administer livestock grazing on public lands in a manner which would protect and improve this area's grazing resources.

We classify your Draft Environmental Impact Statement as LO-1. Specifically, we have no objections to the project as it relates to Environmental Protection Agency's (EPA) legislative mandates. The Statement contained sufficient information to evaluate adequately the possible environmental impacts which could result from project implementation. Our classification will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal actions, under Section 309 of the Clean Air Act.

Definitions of the categories are provided on the enclosure. Our procedure is to categorize the EIS on both the environmental consequences of the proposed action and on the adequacy of the Impact Statement at the draft stage, whenever possible.

We appreciated the opportunity to review the Draft Environmental Impact Statement. Please send our office two copies of the Final Environmental Impact Statement at the same time it is sent to the Office of Environmental Review, U.S. Environmental Protection Agency, Washington, D.C.

Sincerely,

Frances E. Phillips Jr

Adlene Harrison
Regional Administrator (6A)

Enclosure

ENVIRONMENTAL IMPACT OF THE ACTION

LO - Lack of Objections

EPA has no objections to the proposed action as described in the draft impact statement; or suggests only minor changes in the proposed action.

ER - Environmental Reservations

EPA has reservations concerning the environmental effects of certain aspects of the proposed action. EPA believes that further study of suggested alternatives or modifications is required and has asked the originating Federal agency to re-assess these aspects.

EU - Environmentally Unsatisfactory

EPA believes that the proposed action is unsatisfactory because of its potentially harmful effect on the environment. Furthermore, the Agency believes that the potential safeguards which might be utilized may not adequately protect the environment from hazards arising from this action. The Agency recommends that alternatives to the action be analyzed further (including the possibility of no action at all).

ADEQUACY OF THE IMPACT STATEMENT

Category 1 - Adequate

The draft impact statement adequately sets forth the environmental impact of the proposed project or action as well as alternatives reasonably available to the project or action.

Category 2 - Insufficient Information

EPA believes the draft impact statement does not contain sufficient information to assess fully the environmental impact of the proposed project or action. However, from the information submitted, the Agency is able to make a preliminary determination of the impact on the environment. EPA has requested that the originator provide the information that was not included in the draft statement.

Category 3 - Inadequate

EPA believes that the draft impact statement does not adequately assess the environmental impact of the proposed project or action, or that the statement inadequately analyzes reasonably available alternatives. The Agency has requested more information and analysis concerning the potential environmental hazards and has asked that substantial revision be made to the impact statement. If a draft statement is assigned a Category 3, no rating will be made of the project or action, since a basis does not generally exist on which to make a determination.

12

July 10, 1979

Bureau of Land Management
P.O. Box 1397
Roswell, N.Mex. 88201

Dear Sirs,

I am writing about the action that is being taken on the Grazing Industry by the B.L.M. on the lands in East Chaves County, East Eddy County and the southwest portion of Lea County.

I think this is a ridicolus thing
to cut the grazing permits of the Ranchers
12-1 on a one shot test and observation of the
Range. It should be tested at least 4 times
a year for 5 years. It seems that the
range has improved over the last 50 years
of grazing with betee management.

I think that we should make every effort to increase the numbers of livestock to help take care of the increasing Population.

Yours truly,
Jesse F. Rayroux
P.O. Box 644
Carlsbad, N.Mex. 88220

Response 12-1

See Response no. 7-1

July 14,1979 13

Mr. Tom Kiddoo
Public Affairs Specialist
Roswell District, BLM
P.O.Box 1397
Roswell, New Mexico 88201

Dear Sir:

Re: Roswell Area Environmental Impact Statement

This entire study is representative of the system that is retarding the social and economic development in the United States today. When a group of tax supported bureaucrats take it upon themselves to destroy a vital aspect of the economy of the Southwestern United States, by an insidious attack on the livelihood of a group of hard working, independent minded citizens, in order to replace them with 8 to 5 minded federal workers, it becomes imperative that all citizens devoted to free enterprise must respond with every resource at their command.

It is impossible to point out all the inconsistencies, errors and unsubstantiated innuendoes contained in this environmental impact statement, however, since the environment must contain all factors, I will list a few questions affecting the economic and social conditions within the Roswell district which were not assessed by the report.

a) What effect will this proposed program have on employment opportunities for employees of the BLM?

b) What has been the cost incurred by the BLM in the planning, research, writing, and publishing of this environmental impact statement?

c) When the ranchers who have staked their personal resources on the development of these lands are no longer able to live and work in these remote areas, will we have federal employees mending fences, and repairing windmills?

d) In the past ten years, what has been the annual cost to the U.S. Treasury of BLM supervision?

13-1 e) In the next twenty years, what are the estimated annual costs to the Treasury expected to be, if this program is adopted?

f) In the past ten years, what have been the annual receipts of the Treasury from surface leases for ranching operations?

g) In the next twenty years, what are the annual receipts of the Treasury from surface leases for ranching operations expected to be, if this program is adopted?

Response 13-1

The impact on the federal treasury from reduced grazing receipts would be approximately $124,312 during the lowest year, 1984. By 1989, income from grazing receipts would return to 1979 levels and, by the year 2000, would rise above present levels by a total of $252,323, an overall increase of 57 percent in the long term.

h) How do the attitudes and values of BLM employees compare to those of ranchers?

i) What is the estimated cost of construction and maintenance of the proposed perching fences for raptor birds, and where did the birds perch fifty years ago when there were no fences anywhere?

I will readily admit that some of these questions may be rhetorical and leading to a conclusion; however, the Environmental Statement to which these questions are addressed make it necessary that they be asked and, needless to say, answered.

Throughout this report is found evidence of a pervasive attitude that those in government with nothing to risk and nothing to gain, will be better able to manage the resources of this area with tax dollars, than those ranchers who have been raised in this area, taught by their parents and grandparents the particular quirks and peculiarities which are to be found, and each year risk their personal fortunes and livelihoods to the fate of the land and the weather. It is interesting to note that those areas already under BLM management have been recommended for more cuts in allotments than those which are still "uncontrolled." 13-2

My personal recommendation for the Roswell district is to concentrate on the economical use of tax dollars by eliminating excessive recordkeeping and interference with private contractors of federal lands, to observe and offer recommendations and assistance for better grazing lands, and to allow private contractors the freedom to manage their investment in a manner which will allow them enough profit to continue providing cattle for the market.

Thank you for your kind attention. I will forward this letter, and also your anticipated reply to congressmen and Senators from the peripheral area, namely Representatives Harold Runnels, Kent Hance, and Richard White and Senators Harrison Schmidt, Pete Domenici, John Tower, and Lloyd Bentsen.

Sincerely,

Ray Sharbutt
1010 W. Louisiana
Midland, Texas 79701

Response 13-2

Regarding existing allotment management plans (AMPs) which have intensive grazing systems, seven plans have not been fully monitored or implemented to insure that production is stabilized. As stated in the proposed action, the existing AMPs would be revised to include measures which would meet the physiological requirement of the forage plants. Also, several existing AMPs were designed around brush control practices which could not be completed until an environmental statement has been prepared. Normally, reductions in stocking rates were not required when AMPs were developed. However, voluntary reductions were requested and, in most cases, ranchers responded. By comparing changes from licensed use on existing AMPs with changes from licensed use on those areas proposed for development of specific grazing systems, one can see that licensed use on the AMPs are more nearly in line with the forage production than are those proposed for systems (16 percent versus 32 percent reduction). Rest-rotation grazing systems are not the only systems which will meet the physiological needs of forage plant and other resource needs. Deferred rotation, seasonal rest, and seasonal deferment systems, plus others could meet these needs. The systems which would be developed would be coordinated with the rancher to best meet all the management needs. The system could be named after it has been developed. A grazing system may be implemented as a condition of the grazing lease and does not require the items stated under an allotment management plan.

HAROLD RUNNELS
2D DISTRICT, NEW MEXICO

COMMITTEE ON ARMED SERVICES
SUBCOMMITTEES:
RESEARCH AND DEVELOPMENT
INVESTIGATIONS

COMMITTEE ON
INTERIOR AND INSULAR AFFAIRS
SUBCOMMITTEES:
OVERSIGHT AND INVESTIGATIONS, CHAIRMAN
PUBLIC LANDS
MINES AND MINING

Congreſs of the United States
House of Representatives
Washington, D.C. 20515

WASHINGTON OFFICE:
1535 LONGWORTH BUILDING
AREA CODE 202: 225-2365

DISTRICT OFFICES:
SUITE A, MCCRORY BUILDING
LOVINGTON, NEW MEXICO 88260
AREA CODE 505: 396-2252

FEDERAL BUILDING, ROOM B201
LAS CRUCES, NEW MEXICO 88001
AREA CODE 505: 524-8022

FEDERAL BUILDING, ROOM 100
GALLUP, NEW MEXICO 87301
AREA CODE 505: 863-3400

14

July 11, 1979

Mr. Tom Kiddoo
Public Affairs Specialist
Roswell District, BLM
P.O. Box 1397
Roswell, New Mexico 88201

Dear Mr. Kiddoo:

I am in receipt of the draft environmental impact statement prepared by your office concerning a grazing/management proposal for the Roswell District.

The environmental impact of your proposed study is subject to considerable debate, both pro and con, but the economic impact of the BLM project can be described in one word, "disaster".

Recognizing that the Roswell BLM office has previously taken the position that cattle and other forms of livestock are foreign to the natural environment of these public lands of Eastern New Mexico, it appears that some within BLM have made the decision to eliminate this unwanted (apparently in the eyes of BLM) domestic livestock by making it economically unfeasible for any rancher to continue such operations on BLM lands.

I recognize also that the above suggestion will be rejected, but all the concern displayed about the role of antelope and now the lesser prairie chicken in recent months can only lead one to believe that perhaps the Roswell Daily Record was correct in suggesting that perhaps the ranchers are confronted either with a conspired effort to force them off public lands or are victims of colossal, unflinching stupidity.

I don't know how many lesser prairie chickens you've eaten in recent months, but most of us place a greater need on an adequate beef and lamb supply at the super market. The BLM proposal once again smacks of the all too popular image which the average citizen has of the federal government, that being that too many in the federal government think they always have the answer as to what's best for the average citizen. They seem to forget who is working for whom.

14-1 It is strongly suggested by area ranching authorities that this proposal if adopted would mean the elimination of over 40 percent of the beef currently produced in this area and the economic impact of such a loss would be felt by many other segments of the Eastern New Mexico economy. I have seen nothing presented by BLM that would suggest the long term benefits provided by their proposal would offset the immediate economic disaster created by such a plan.

BLM consistently bases their reasoning for development of such projects upon the multiple use concept adopted as national policy by the Congress in passage of the Federal Land Management Act. As a member of the Congressional Committee which considered this legislation, I can assure you that it was not the intent of Congress for BLM to develop plans to bring about economic ruin of the ranching community. Specifically, I call your attention to the wording of paragraph eight of section 102 of Public Law 94-579. I have underlined some of the wording which BLM in this new proposal has apparently chosen to ignore.

"The public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource and archeological values; that where appropriate will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use."

Response 14-1

The facts which have been presented in this document indicate that an over-statement of forage production, perpetuated over many years, has been made. This purported production, in many cases, has never been used, perhaps because ranchers recognize that it is an over-statement. This recognition is reflected by the licensed use that has been made through the years. However, overuse on many acres of rangeland in the ES area is evident and the alignment of stocking rates with the forage production in these cases is a recognition of fact, rather than being a theoretical loss of livestock production. Unless these rangelands are restored to a productive level which approaches their potential, this loss will not be recovered, but would remain at the reduced level. A 40 percent loss in the area's production of beef would not occur. In fact, this loss would even be less than 28 percent for two reasons:
1. ranchers may have actually sold down because of dry conditions, and
2. much of the beef production comes from farms and ranches which do not have public lands. Also, according to BLM records, the 10-year average licensed use is less than the 3-year average on which the analysis has been based. Therefore, the stated production level has been long-term. However, economically the ES indicates that in the short-run (early 1980s), livestock sales from the ES area would drop to a low of $1.5 million per year before improving, and this decline would represent a significant adverse impact of the proposed action locally, although not in the region as a whole. By 1990, the sale of livestock would again reach present levels through range improvements and increased numbers of permitted livestock. By the year 2000, there would be significant gains in ranch employment and income. These short-term versus long-term trade-offs are discussed in Chapter 6.

Mr. Tom Kiddoo
July 11, 1979
Page 3

Further, paragraph 12 of this same section goes on to state..."the public lands will be managed in a manner which recognizes the Nation's need for domestic sources of minerals, food, timber and fiber from the public lands..."

14-2 In reading the content of the "East Roswell Draft Grazing Environmental Statement", it appears that the authors of this document failed to read all the wording of the policy established by Congress. The message should have gotten across in the passage last year of additional legislation dealing with the manner in which BLM was imposing AMP's upon lease holders.

By BLM's own figures this proposal would mean a loss of 27 percent of the present livestock sales in the area and net returns to the ranchers would decrease by 61 percent. I wonder if the BLM employees would be as excited about a proposal that we reduce their levels by 27 percent and cut the salaries of those remaining by 61 percent during the same time span we expect the local ranchers to sit by while BLM implements this grandiose plan.

I find the draft statement totally unacceptable and would urge the State Director to instruct his staff to return to the drawing board to develop a constructive plan that calls for the federal government to work with the lease holder in truly seeking to develop the multiple use concept envisioned by Congress.

It is my desire that this statement be placed in the official hearing record in order that the citizens of the 2nd Congressional District will be aware of the fact that I, as their Representative in Congress, am not a party to this proposal.

Sincerely,

Harold Runnels

HAROLD RUNNELS, M.C.

lkm

Response 14-2

AMPs have not been developed and are not being proposed as a mandatory component of the proposed action. Following the completion of the ES, the grazing management program will be developed through the careful and considered consultation, cooperation, and coordination with the lessees, permittees, and land owners involved. The District Grazing Advisory Boards and any State having lands within the area to be covered would also be consulted. Implementation of the proposed action is dependent upon the District Manager's decision which is anticipated to be developed in November of 1979 after careful consideration of the impacts expressed in this document, public input, together with consideration of BLM mandates and policies, and recent law or court action findings.

LAMAR UNIVERSITY
P. O. BOX 10082
BEAUMONT, TEXAS 77710

MUSEUM SERVICES:
SPINDLETOP MUSEUM
GLADYS CITY BOOMTOWN

17

July 18, 1979

Mr. James O'Connor, District Manager
U. S. Department of Interior
Bureau of Land Management
District Office
Box 1397
Roswell, New Mexico 88201

Dear Mr. O'Connor:

17-1 I have just received information about the possibility of the use of chemicals for brush control within the Mescalero Sands Area. This concerns me greatly for during my studies at Eastern New Mexico University while doing graduate work on the lesser prairie chicken for two seasons, I can honestly say now that the 2-4-T and its derivatives certainly affected the chicken populations in the Elida-Milensand areas. I would like to think that this as a "natural study area" will not fall under the regions that are to be treated.

I would like to request a copy of the East Roswell Grazing Management Draft Environmental Statement so that I might make a more knowledgeable assessment of the proposal.

Again, thank you for your assistance in this matter.

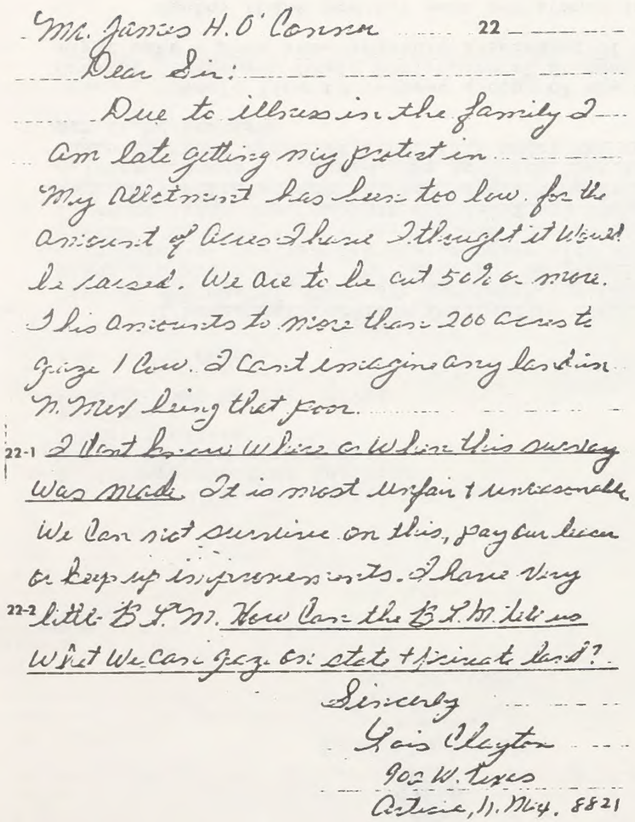
Sincerely,

Calvin

Calvin B. Smith
Director

Response 17-1

The BLM would be treating mesquite areas near the Caprock but would not be using 2-4-5T or any of its derivatives. Chemicals which would be used are picloram and dicamba. The toxicity level would be well below lethal rates for prairie chickens and other animal species.



Mr. James H. O'Connor 22

Dear Sir:

Due to illness in the family I
am late getting my protest in
My Allotment has been too low. for the
amount of acres I have I thought it would
be raised. We are to be cut 50% or more.
This amounts to more than 200 acres to
graze 1 Cow. I can't imagine any land in
N. Mex being that poor.
22-1 I don't know where or when this survey
was made. It is most unfair & unreasonable
We can not survive on this, pay our loan
or keep up improvements. I have very
22-2 little B.L.M. How can the B.L.M. tell us
what we can graze on state & private land?

Sincerely
Lois Clayton
902 W. Texas
Artesia, N. Mex. 8821

Response 22-1

See Response No. 7-1.

Response 22-2

The proposed action provides for private or state lands to be managed separately from the public lands, should the state or private entities so desire. However, should they choose to use the area in a consolidated manner, compliance with the provisions designed to protect resource values on the public lands would be required. This includes stocking levels and certain aspects of grazing systems such as minimum rest requirements. Constraints placed on intermingled, unfenced, nonfederal land would be limited to actions necessary to properly manage the public lands (See discussion on p. 1-33 which explains the interrelationships between state, private, and federal lands).

STATE OF NEW MEXICO
NATURAL RESOURCES DEPARTMENT

BRUCE KING
Governor
WILLIAM S. HUEY
Secretary

Villagra Building
Santa Fe, New Mexico 87503
(505) 827-5231

JIM KING
Deputy Secretary

25

July 18, 1979

Mr. Tom Kiddo, Public Affairs Specialist
Roswell District, BLM
P. O. Box 1397
Roswell, New Mexico 88201

Dear Mr. Kiddo:

After reviewing your East Roswell Draft grazing Environment Statement, we would like to comment on several spelling and status correction on table B-6 on page B-11.

25-1

1) The Pecos pupfish has been officially named Cyprinodon pecosensis. (Note there is no "m" at the end of Cyprinodon).

2) Blue sucker is misspelled as well as its scientific name, which should be Cycleptus elongatus.

3) The scientific name for the Gray Redhorse is misspelled, it should be Moxostoma congestum.

4) The scientific name for the Green Darter should be Etheostoma not Etheastoma.

5) The scientific name for the Eastern Barking frog should be Hylactophryne augusti latrans.

6) The scientific name for the Texas Slider turtle should be Chrysemys concinna texana.

7) The scientific name for the Sandune Sagebrush lizard should be Sceloporus graciosus arenicolous.

8) The scientific name for the Mottled Rock rattlesnake should be Crotalus lepidus lepidus.

9) The scientific anme for the Pecos-Western Ribbon snake should be Thamnophis proximus diabolicus.

Response 25-1

Table 8-6 was edited to reflect these changes. The State status for all species has been checked and corrections have been made as appropriate.

25-1 cont.

10) The scientific name for the Blotched Plain-bellied Water snake should be Natrix erythrogaster transversa.

11) The scientific name for the Baird's Sparrow should be Ammodramus bairdii.

12) The scientific name for the Mississippi Kite should be Ictinia mississippiensis.

13) The scientific name for the Redheaded Woodpecker should be Melanerpes erythrocephalus.

14) The scientific name for the Bell's Vireo should be Vireo bellii.

15) The scientific name for the Least Tern is Sterna albifrons.

The State status on some of these species has been changed since the printing of this document. I am enclosing an updated list for your information.

Thank you for allowing this opportunity to be a part of your planning process.

Sincerely,

Janie Chavez

Janie Chavez, Environmental Analyst
New Mexico State Heritage Program

Enc.

EDMUND S. MUSKIE, MAINE, CHAIRMAN

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United States Senate
COMMITTEE ON THE BUDGET
WASHINGTON, D.C. 20510

27

July 18, 1979

Mr. James H. O'Connor
District Manager
Bureau of Land Management
P. O. Box 1397
Roswell, New Mexico 88201

9-35

Dear Mr. ~~O'Connor~~ Smokey:

Enclosed is a copy of my statement delivered at the hearings Tuesday, July 17th, on the East Roswell Environmental Statement.

I sincerely appreciate your giving me the opportunity to present these remarks.

Kindest regards.

Sincerely,

Pete V Domenici

PETE V. DOMENICI
United States Senator

Enclosure: as stated

PVD: fdep

STATEMENT BY
SENATOR PETE V. DOMENICI
CONCERNING THE
EAST ROSWELL ENVIRONMENTAL STATEMENT
DELIVERED IN ROSWELL, NEW MEXICO ON
JULY 17, 1979

TEXT

My remarks this evening will center on two areas:

--- conflicting jurisdictions of management over private lands, state lands, and federal lands; and

--- the economic and cultural effects of the proposed action.

The problems of conflicts in management has increased drastically in recent years, as the federal government has sought to encroach upon the prerogatives of the various State Land Offices and the private land holders. The problem is especially severe in states like New Mexico, where we have a checkerboard land ownership pattern, with the intermingling of private, state and federal lands.

27-1 In response to this and other public lands problems, the Congress in 1978 passed Public Law 95-514, the Public Rangelands Improvement Act of 1978. I sponsored an amendment which was included in this legislation, which directed the Secretary of the Interior to enter into "careful and considered consultation, cooperation and coordination," with the permittees, district grazing advisory boards, and the State Land Offices, prior to implementing allotment management plans. However, one would never know this legislation ever passed by reading the East Roswell Environmental Statement. In fact, it would appear the BLM has changed their policy on implementing ES's since the passage of PL 95-514. The Rio Puerco and East Socorro Environmental Statements are to be

Response 27-1

See Response No. 14-2.

implemented by allotment management plans, but not the East Roswell Statement. The East Roswell Statement makes reference to "grazing systems," "specific grazing systems," "specific grazing management systems," "allotment-specific management," and "allotment grazing management systems." One only finds reference to allotment management plans when the document discusses the 20 already in existence, and even they are described elsewhere in the ES and in the tables as "Existing Specific Grazing Systems." Now, the 20 existing AMPs are called "Existing Specific Grazing Systems" in this document; therefore, that can only mean the 90 "Proposed Specific Grazing Systems" are also AMPs and can only be implemented, (and I will quote the law here again), after "careful and considered consultation, cooperation and coordination with the lessees, permittees, and landowners involved, the district grazing advisory boards...and any State or States having lands within the area to be covered by such allotment management plans." Moreover, House Report 95-1122 states," The Federal Land Policy and Management Act authorized the Secretaries of Interior and Agriculture to develop plans and intensive grazing management systems for the public lands, and to incorporate such plans in the terms and conditions of grazing permits and leases. Such plans are generally labeled 'allotment management plans'..." So, whatever you want to call it, the intent of Congress is clear.

Concerning the State Land Office, the ES states: "A coordination meeting with the State of New Mexico concerning the involvement of state lands in the proposed action was held in July 1978. Close coordination would be necessary throughout the process of developing a grazing system." However, in communications to me, the State Land Office says these meetings have amounted to the BLM asking for input, and then stating they will make all final decisions. This is totally unacceptable. In light of Section 8 of PL 95-514, what mechanisms have been put in place by the Bureau to provide for consultation, cooperation and coordination with the permittees, landowners, the State Land Office and the District Grazing Advisory Boards with respect to the 90 proposed Specific Grazing Systems? Furthermore, Section 8 of the above Act also states: "The Secretary concerned may revise or terminate such plans or develop new plans from time to time after such review and careful and considered consultation, cooperation and coordination with the parties involved." Again, by what process will the Bureau comply with the law in implementing the proposed revisions of the 20 Existing Specific Grazing Systems?

Next I would like to turn to the economic and cultural impacts of the proposed actions; and the following can only be described as disastrous:

--- a cutback of 28 percent in Animal Units, not counting those cuts already initiated by the ranchers;

--- an annual net loss of income of $1.1 million dollars;

--- average ranch income declining by 50 percent during the '80s

- between 50 and 60 ranchers having to seek outside income just to survive
- a loss of 75 jobs in the area
- market values of ranches dropping by $8.5 million dollars and ability to borrow dropping by $3.5 million dollars while at the same time decreases in livestock sales will diminish the ranchers' capacity to pay off outstanding loans; and
- the loss in revenue from our State Trust Lands and the concomittant loss in income to our educational, health, penal reform and other Trust Beneficiaries.

The real tragedy is that our people are asked to absorb these impacts, when the proposed actions are based on documents of questionable value and accuracy. One cannot review the technical and professional critique of the East Socorro Environmental Statement prepared by the Task Force at New Mexico State University and not realize that that Statement is a scientifically shoddy document. Now, I can sympathize with the Bureau's problems in preparing these statements, in lieu of the court-ordered time constraints imposed upon you. However, I believe the Bureau is dead wrong in rushing to implement these proposed actions, thereby tying together the filing of the ES with the implementation of programs. If the Bureau thinks the people of New

Mexico, and their city, county, and state governments are going to sit idly by and accept these actions, you are sadly mistaken.

The costs to the taxpayer of these Environmental Statements is staggering. Each Statement will cost approximately $500,000 and 212 studies must be filed. Simple arithmetic pegs the total cost at well over $100 million. The absurdity is that recent testimony before the Energy and Natural Resources Committee indicated that improvements to the range lands as a result of the contemplated programs would be significantly less than $100 million. That means paying more for advice than the cure.

Putting the figure in further prespective, the Bureau of Land Management has spent only $30.3 million dollars on range improvement since 1974. Wouldn't it be a lot simpler spending the money on improvements rather than suggestions?

Let me close by providing two examples of government actions which relate to these hearings, and help explain our people's attitude towards government. First, the Secretary of Agriculture has publicly called upon the livestock industry to "beef up" their herds and increase production, while at the same time, the Secretary of Interior is cutting back on herds and decreasing production. Aren't these fine examples of government leadership?

27-2 Secondly, the Bureau of Land Management refuses to adequately mark their transect locations. Now what does this mean? It means our government will provide verification to the Soviet Union in the SALT II Treaty, but that same government refuses to provide verification

Response 27-2

The methodology which was used in this initial survey of forage production does not require that transects be permanently marked. If the purpose were to determine trend over a continuing period of time, then permanent markers would be necessary. As conducted, the purpose of the study was only to determine the present level of forage production. Trend and utilization studies using permanently marked transects are being or will be established in the very near future. The survey used a sampling technique. To recheck, it would not be necessary to exactly reproduce the sample transect locations but only to resample an area which is representative of the subtype being surveyed.

This data is considered to be reasonable and realistic. The method used is an accepted method for determining production, and is the most current and reliable data available.

to American ranchers in environmental statements!

In concluding, I would also like to state that neither I nor my staff have had adequate time to completely review and digest this ES. Therefore, I officially request a 90-day extension of time for the public to submit comments.

Thank you.

Hope, New Mexico
July 20, 1979 30

Mr. James H. O'Conner,
District Director,
Bureau of Land Management,
PO Box 1397
Roswell N. M. 88201

Dear Mr. O'Conner:

I am writing you concerning the Environmental statement. 30-1 I do not feel the ranchers are getting a fair evaluation on the survey of the rangeland. A large part of this Country is semi arid and if rainfall isnt sufficient it looks bad, but is able to recover on only a small amount of moisture. I believe it would be better to take the survey on a seasonal basis and more time and consideration should be given before taking such drastic measures.

I also feel it only fair that the rancher be contacted so he can be present while the survey is being conducted.

Thanks for all considerations

Yours truly
Johnny Cradborne

Response 30-1

See Response no. 7-1.

①

Bureau of Land Management 46

Dear Sir:

I have been reading the East Eddy, East Chaves, and Lea Counties Environmental Impact Statement and felt I had to make a few comments.

46-1 The proposed cuts in animal units on this land is very excessive. The study was conducted after several years of drouth. The basis of the study was on gramma grass and there was very little allowance for other types of forage such as salt grass, Shinnery Oak, weeds, and other forbs that cattle maintain themselves on when the season is right.

The proposed Allotment Management Plans are not in the best interest of the rancher or the taxpayer. The BLM will not be managing just the land; they will also be managing the livestock, which will force many people to stop their livestock upgrading and improvement plans.

Response 46-1

See Response no. 7-1.

②

The improvements planned by the BLM will cost the taxpayer three or four times what the individual rancher could install them for. However, we are not allowed to make any improvements on BLM land at this time.

Most ranchers would probably make more improvements on the land if we could get a permit to do so and if our futures on BLM land were more secure. It's hard to justify the cost of improvements with the constant threat of reduction of our grazing permits.

The draft states that the rancher distrusts the BLM; why wouldn't we when the grazing fees have been drastically raised in the last five years? Also, we are threatened with having our permits cut as much as 65%. Many will find it necessary to go to work off the ranch; what kind of job will a man 55 to 60 years old find?

Most ranchers have spent their

③

lifetimes building and improving these ranches and I don't think the BLM can do better!

Finally, these cuts come at a time when consumers are crying over the price of meat. This kind of reduction in the cow herds of the western United States will certainly push prices up.

Thank you for your time.

Yours truly,

Laurie Kincaid
1050 Standpipe Rd.
Carlsbad, N.M. 88220

Yeso, New Mexico
July 21, 1979 51

Dear Sir:

This is a comment on the East Roswell Grazing Environmental Draft:

I feel that the BLM are totally out of their realm in desiring to manage rangeland which they have no real experience in dealing with. I can describe the ridiculousness of such a venture in terms you may understand.

Picture yourself going home one day, a home which you have probably owned for many years, a home you built yourself, scraping and saving till you could construct two or three bedrooms, a kitchen, a living room and even a bathroom. Oh! How proud you and your family are of this house, however small or different. It belongs to you! You work at the office all day only to return to your new house and work on it till all is complete. You and your family have put up the walls, installed the plumbing, electricity, the heating and cooling. You roofed this house and you painted the walls. You and your wife selected the floor covering, the wall-paper and the furniture. You all know exactly what you want and need to make this house your HOME! Then you turn your attention to the landscape. How you dream of the green lawn with willow trees, flowers and a curving driveway. The back yard will have room for the children to play and room for the dog you plan to have. Also you will put up a basketball goal for your son who promises to become a great basketball player in his school. As you work on this landscape, it all fits into place and after possibly years you have what you and your wife have always dreamed of. You can enjoy this home. It doesn't have to make you money. As far as you are concerned, nothing should need repairing or replacing for several years. Now the money you make at work can go in the savings for college for you children and other things. Years go by and you and your family really enjoy your home.

Then one day you come home, ready to relax in the front yard or in front of the TV. But who should be there waiting, sitting in you favorite chair, but the Federal Home Safety Agent!* Oh! No! You had hoped he wouldn't come! You had heard he had been to visit some neighbors a few blocks away but you assumed that those neighbors had not taken care of their homes or maybe had not built them with care. Why would he come to your home, so well built, so neat and all repairs kept up to the best of you ability? What could he want? What was the government up to this time? Your wife was in tears. The government man was apologetic and very nice but he said "What can I say? I must do this. They told me in Washington D.C. that it was necessary." You say "Do what? What are you talking about?" The government man begins to speak. " I have been through your house and inspected your yard. According to the rules and regulations of the Home Safety Code which was passed last month by most of the Congress and of course the President, your house is deemed unsafe and you must evacuate the premises until all necessary changes have been made to the satisfaction of myself. Your yard is unsafe and all children are banned from crossing or playing on it. Some of the things deemed unsafe are:

1. the electricity
2. the plumbing
3. the complete bathroom--the tub is too slippery, the floor should be carpeted, the water runs too fast and the medicine cabinet is too low.

*fictitious agency (I HOPE!!!)

4. the furniture should be Early American to go with the house.
5. the TV is totally unsafe due to radiation.
6. the kitchen is also unsafe. You should have a microwave oven, a gas cooktop and a huge fan above. The food I found in your refrigerator is not proper for you to eat.

As for the yard:

1. you are not allowed to have a German Shepherd. You must acquire a Peekapoo. You must fence the back yard to where the neighborhood kids can crawl under...it must be at least 36 inches off the ground so they can go through at a dead run.
2. the trees should be removed. They have no real use and could fall on the house.
3. the front lawn must be paved so that the Home Safety Agents, who will come here twice a week, may have room to park.

All of these "improvements" must be done at your own expense. Please have them completed in 3 months. If you have any comment on this inspection, you have 2 hours to get it to Washington D.C. in a typewritten letter."

The agent leaves. You are dumbfounded and see no way out. Of course you don't have near enough money to change your whole house. All you have lived and worked for has gone down the drain. Ruined by some bureaucrats in Washington D.C. who have no idea what they are doing and who dictate orders from their plush offices. You know that your house is safe. Why, you have lived in it for years and raised your children in it. And what is wrong with a German Shepherd, anyway? What will you do? You will either have to join with your neighbors and or give up. What will it be? It takes money and time to fight people who live thousands of miles away and think what they are doing is right and have the money and influence to back it up? Will you fight a loos-battle? Maybe, but you must, for you will fight for all you have to live for.

Now, Sir, please put the Ranchers in your place, only in much different circumstances. They are practically being ridiculed as to their knowledge of how to care for the land. They are being treated as someone who needs to be told each and every move to make. They know more than anyone what is good for their ranches. Does it really make sense the rancher should be dictated to by a group of people who have obtained their knowledge from books? Doesn't practical experience carry any weight anymore? Let me tell you a few things about the average rancher...not the rich oil man who bought a big ranch...but the man who has worked all of his life for his ranch, the man who has invested possibly 40 years in one ranch. He got his start by acquiring some deeded land and proceeded to lease both federal and state land. At one point he was given the chance to buy both. But he needed what profit he made to pay off his deeded land. So, he continued to lease. He built fence, dug ditches, laid pipelines, built barns, corrals and his house. He has stayed up all night watching a contrary pump 20 miles from the house to make sure it pumped enought water for his livestock. He has endured drouths, ice storms, snowstorms and howling winds. He has ridden in blizzards all night trying to find baby calves so he can get them to a warm place. Coyotes have played havoc with his sheep herd and have killed baby calves, too. He depends on his wife and children to help him through these trials. He HAS to care for his land, both BLM and private, for he depends on it for his livelihood. The rancher has rotated the grazing when possible and tried to rest pastures. Most ranches with BLM leases are large. Each pasture averages up to 10 sections and many pastures are much larger. The time and expense of fencing and supplying water to the smaller pastures is emmense. The rancher would gladly work with the BLM on such an operation if he were given a free hand. He would know exactly what was best for his ranch. He could arrange his pastures and waterings to suit the country which he has lived on for many years. Until recently, most ranchers have not had the finances to cover such improvements. Why, then, should the BLM assume that the ranchers are against all change and improvements? Why persecute the ranchers because they are independant and self-sufficient? This has been their way of life. They would never have made it this far had they not become such. And why assume they have abused and over-grazed their lease land? Especially when this assumption is based on one survey taken in one year and a dry year at that. This survey should be taken over a period of ten years at the least. That is the only fair way to evaluate the vegetation as there are seldom two good years in a row in this country. 51-1 And, why assume that the rancher is at fault in denying the public access to his lease land (if, indeed, he does) when it is mostly the public who abuse the land. I only refer to the few who have no respect for the land, either BLM or private. These few can cause more damage than hundreds of people. They throw rocks in storage tanks and tear up float pans causing thousands of gallons of precious water to be lost. The loss of water can cause severe weight loss in cattle or maybe even death. These few drive their vehicles over the grassland, tearing up the grass and causing erosion. They might shoot at livestock, some only for play, others for meaness. These few troublemakers can cause much bitterness in ranchers towards the public roaming their leased rangelands. But do ranchers really persecute all of the public for this? No, they are a trusting sort and will allow access to anyone who is friendly and asks politely. Should ranchers be prosecuted for the few who do abuse their land? I think not. Each rancher should be treated individually, not as a whole.

The ranching industry contributes a great deal to the communtity and the country. It supports many city businesses, it feeds millions of people and supplies jobs for thousands. It is a unique way of life, yes, and independent, self-sufficient life, a way of life that can not be destroyed for it is part of the great backbone of America!

Sincerely,

Cindy Key

Boot Ranch,
Yeso, New Mexico

Response 51-1

See Response no. 7-1

56

Wm. F. Brainerd
ATTORNEY AT LAW

SUITE 124 · PETROLEUM BLDG.
POST OFFICE BOX 1891
ROSWELL, NEW MEXICO 88201
(505) 623-4131

July 25, 1979

COPY

Mr. Art Zimmerman
State Director, BLM
Post Office Box 1449
Santa Fe, New Mexico 87501

Dear Mr. Zimmerman:

I am writing to protest the actions of the BLM with respect to the lands in East Roswell District which, I understand, include east Chaves County, Eddy County and Lea County.

56-1 Given the hardships already endured by the people who try to ranch in this area, I fail to see how a cut in their cash flow can do anything other than drive the small rancher out of business. Indeed, it would appear that this is the ultimate objective of the BLM.

To take one-quarter of the cash flow out of any business would, necessarily, mean that it has to operate at a loss. The BLM program means that almost every rancher in the area effected must sell out or be foreclosed.

The action of the BLM is very oppressive and, if it represents the long-term view of the BLM, it can only stir resistance which will, in the end, instill violence. I am sure that this is not the goal of the BLM or of the ranchers who are involved.

I trust that the Bureau will heed the words of Alex Armijo, the Commissioner of Public Lands of the State of New Mexico. I also trust that the BLM will not try to run roughshod over the ranchers because such a course will, in the long run, be very counterproductive.

Yours very truly,
Original signed by:
WM. F. BRAINERD
Wm. F. Brainerd

cc: Mr. James H. O'Conner
District Director, BLM ✓

Response 56-1

Some ranch operations will be able to absorb the reductions in cash flow and remain in business. Others will not be able to and may need to seek outside employment. This situation is stated on p. 3-59.

July 23, 1979

58

Mr. James H. O'Conner
District Director
Bureau of Land Management
P.O. Box 1397
Roswell, New Mexico 88201

Re: BLM Allotment Management Plans and Permit Reductions

Dear Mr. O'Conner:

The purpose of this letter is to register my opposition to the proposed cuts in grazing permits in the East Chaves County areas. Inasmuch as I know these ranchers personally and am quite familiar with their lands, I believe these cuts are unwarranted.

I must also oppose the issue of Allotment Management Plans for this part of the country. For a period of five years, I, in conjunction with the BLM, tried a rotation plan which was a 58-1 complete failure. These rotation systems will work only in an area which has a minumum of 25 inches annual rainfall or irrigation. In a very dry country such as ours it is not possible to place large groups of livestock together without doing serious damage to the pastures.

Further proof of this can be found by having qualified persons spend some time at these particular ranches with the cowboys who work these ranches. They will then see exactly what the cattle are eating and what their grazing habits are. From this study you will be able to see that what I say is true.

Sincerely,

Henry Townsend

Henry Townsend
1512 West Eighth
Roswell, New Mexico 88201

cc: Mr. Art Zimmerman
State Director BLM
Santa Fe, New Mexico

Honorable Pete V. Domenici
Washington, D.C.

Honorable Harrison Schmitt
Washington, D.C.

Honorable Harold Runnels
Washington, D.C.

Honorable Manuel Lujan
Washington, D.C.

Response 58-1

Literature searches, BLM experience, as well as systems conducted by many ranchers, indicate that rotation systems, properly designed to meet needs of individual land units, can, in fact, work very well in areas receiving substantially less than 25 inches of rain annually. See also Response No. 13-2.

Clarence and Ellen McDonald
P.O. Box 32
Malaga, NM 88263

60

July 24, 1978

Mr. Tom Kiddoo
Public Affairs Specialist
Roswell District, BLM
P.O. Box 1397
Roswell, New Mexico 88201

Dear Sir:

This letter is in protest to the BLM East Roswell Draft Grazing Environmental Statement and the capricious manner in which it 60-1 was decided our grazing permits would be decreased. Our ranch was surveyed during a two-year drought and during the spring, when the grasses had had no time to grow and mature. No consideration was given to other important protein sources to stock and wildlife, such as shinnery oak and weeds, and we were not consulted in the decision to cut our animal units to less than half the origional permit.

When we bought what we call the Pierce Canyon ranch located east of Malaga, NM, twelve years ago, it was little more than sand, rocks, and mesquite and cresote brush due to severe dought conditions during the 1950's. In cooperation with the BLM, we implemented an Allotment Management Program, and voluntarily ran fewer cattle than our permit allowed. Yet, as a result of the Empact Statement, that ranch's permit was decreased from 300 60-2 AUM's to 157 AUM's! In fact, 18 out of 20 allotment management programs received higher grazing cuts than ranches under no program, direct proof that the BLM cannot manage rangeland as well as the ranchers, themselves.

We have had several good rains since the survey, and the grass 60-3 is stronger than ever. Yet, three years from now we will be allowed to run only 157 head, regardless of the amount of rainfall, which is the determining factor in grass and range conditions. We feel, therefore, that in order for a management program to be successful, it should be flexible, rather than the arbitrary, static one which is being imposed upon the ranchers in this area.

We would furthermore like to know how much money was used to conduct these surveys and to compile the over 300-page GES, compared to the amount of money spent in the past two years on brush control and other positive contributions to the improvement of public grasslands.

Response 60-1

See Response No. 7-1.

Response 60-2

See Response No. 13-2

Responses 60-3

See Response No. 7-1.

The entire GES is, in our opinion, an accusation that the ranchers have abused and are now abusing and destroying public lands. This is a gross injustice, since nobody knows better than the rancher the necessity of preserving the land of his or her livelihood. We have endured drought, hail, the IRS, dune buggies, hunters, vandals, and the BLM. We have fought poachers, rustlers, locoweed, cuckleburrs, and now the Environmentalists and Wildlife organizations. Our tanks and windmills have had holes shot in them, our fences have been cut and driven over, and cattle killed and mutilated. Our equipment has been stolen and destroyed, and our wells have had rocks and tools thrown in them. It takes anywhere from 12 to 24 man-hours of work to pull the pipe of a windmill to remove an object which some yo-yo has thrown in just to hear it splash. Our gates have been left down or torn down, and cattle have strayed from pasture to pasture, and it takes at least half a day to round up one average pasture. Our fences have been knocked down on the backsides of pastures to allow four-wheel drive vehicles across, and many cattle pass back and forth before the mutilated fence is found and repaired. Around the stock waterings we have picked up beer cans, pop bottles, dirty disposable diapers, empty shotgun shells. We have cleaned feathers and bloody innards from water troughs so that cattle and wildlife would be able to drink from them. We pay $1.89 per cow, per month, to run our cattle on public lands. Yet bird and deer hunters, arrowhead hunters and four-wheel drive enthusiasts who drive helter-skelter over pastureland, killing grass and creating future wind and water erosion pay nothing for the privilege. Never-the-less, Alternative 7 of the GES suggests the removal of livestock and associated livestock facilities from public lands would "improve the scenic quality" and give "more freedom of movement to both hunters and users of off-road vehicles." (Pg. 8-43.)

The GES is concerned about protecting trees from cattle, and proposes introducing broad-leaf trees to the semi-arid to arid prairieland. They propose to build "exclosures" at no small expense, to keep cattle away from saplings. Enclosed is a snap-shot of one of several dry lakebeds west of our house on the Ruth Ross ranch in east Eddy County. Please note the number of trees which have survived grazing cattle for the past 60 or 70 years. They may not be cottonwood trees, but they do provide shade and protection for birds, and they manage to grow on the amount of rainfall which this area receives. Broadleaf trees, we believe, would not fare 60-4 so well. We assume, also, that the proposal to build exclosures did not include the possibilities of separating small calves from their mothers, thus creating dogies or death by starvation.

The proposal to use three-strand fences in place of the usual four 60-5 and five-strand ones might benefit antelope. They will be useless, however, in containing cattle. Pasture rotation and grazing programs would be seriously impeded if cattle can cross fences at will.

60-6 Brush control through poison spraying is considered by some to be less than 10% effective. Yet the GES proposes this method, as well as taking cattle off sprayed pastures for up to twenty-four months. The expense of spraying, coupled with the loss of grazing fees is just plain poor economics. Controlled burning is also proposed, without any guduantee that the areas burned will receive enough rainfall to prevent wind erosion and resulting serious damage to the land.

Response 60-4

The type of fences used to construct exclosures would be designed to reduce the possibility of calves being separated from mother cows. Larger exclosures would have gates to facilitate removal of livestock in case of blow-outs, broken fences, etc. The primary purpose for constructing exclosures is to protect saplings from livestock utilization and to insure that new trees continue to grow after existing mature trees die.

Response 60-5

Indications are that 3-wire fences used in making pasture divisions are very successful in containing cattle. It is true that pasture rotation and grazing programs could be impeded if cattle cross the fences. This, like all other aspects of the program, would need to be monitored.

Response 60-6

One of the purposes for the initial brush control treatment is to test just how well chemical applications will really control brush. However, cattle removal for the applications of herbicide is not proposed to exceed 16 months. In the majority of these situations, approximately 16 months of rest would be necessary to meet all of the phenological requirements of forage plants and would, therefore, not be considered an additional period of livestock removal. The spray program is an attempt to restore productivity of the range land. It is, therefore, independent of the profit or loss of grazing fees which would result from an adjustment in livestock stocking rates to conform with present forage production.

With regard to controlled burning, areas proposed for this treatment are not highly subject to potential wind erosion. Nevertheless, few plants would be lost from this treatment because these control fires would only remove the dead vegetative material during a period when the live plants are dormant. This releases nitrogen into the soil and improves plant productivity. Plants that would be lost to low rainfall would normally be lost with or without the use of controlled burning.

60-7 According to the GES' own admission, ranching is the most important economic activity in the ES area. (Pg. 2-38.) They also estimate that total reductions from present licensed use would be about 233,885 AUM's (Pg. 8-43.) At $1.89 per cow per month, that would total approximately $44 million of revenue lost to the government yearly in the ES area alone. If the present grazing reductions are enforced, many ranchers, because of their age and location of ranching operations, would be forced to retire or find other employment elsewhere, without the BLM having to initiate the more severe grazing cuts proposed in the GES. As a result, much of the public grazing lands would become totally unproductive, and the surrounding area would suffer a negative economic impact. The BLM would have to hire MORE government workers to take the place of ranchers who have heretofore kept windmills and waterings which both stock and wildlife use, in working condition. In fact, a survey should have been made on the amount of work done by ranchers and the cost of replacing them. The ranchers have, at their expense, erected windmills, drilled wells, built fences, tanks, pipelines and troughs, and kept them maintained. Without the ranchers and their stock waterings, how many of the existing wildlife species would exist today?

The cattle industry is already in short supply of cattle. Any further reductions in cattle numbers would aggravate the problem of increasing beef prices to the consumers.

The GES reports that ranchers believe their way of life is "superior to any other lifestyle", and that we "emphasize the importance of independence, self-reliance, and outdoor work, while distrusting government regulation, urban interdependence, and industrial occupations." (Pg. 2-37.) 60-8 We, ourselves, were not interviewed for our opinions and attitudes, but do admit to loving our lifestyle and wanting to preserve a way of life unique to that of most Americans. We, like most doctors, lawyers, fishermen, and government employees, are proud of our occupation, and resent interference or attempts to force us into other lifestyles. Most people who enjoy roast beef or sirloin steaks are probably glad that there are people either stupid or stubborn enough to persist in a livelihood that demands such long hours of hard work, and returns so little in monetary gains.

We also plead guilty to distrusting government regulations. Who could blame us if they had seen the results of past allotment programs and had read the Grazing Environmental Statement!

The above are but a few of our objections to the GES. Our objections are based on years of our own experience of living on and with the land. We believe that nobody is as qualified as we are to manage grassland, but are willing to cooperate with the BLM in programs which we believe will be effective. All we ask is that the BLM consider our knowlege, learned at the University of Hard Knocks, consult with us in management programs, and not force us from the only occupation we know.

Copies of this letter are being sent to Congressmen Pete Dominici, Harrison Schmitt, Harold Runnels, and Manuel Lujan.

Sincerely,

Clarence and Ellen McDonald

Response 60-7

The actual reduction from present licensed use under the proposed action would be 65,744 AUMs rather than 233,885. The 233,885 AUMs quoted is the reduction which would be required under the "No Grazing" alternative under which all domestic livestock would be removed from the public lands. The revenue lost to the government would be $124,256 per year, not $44 million.

Response 60-8

As stated on page 2-38 of the ES, Harbridge House, Inc., interviewed 100 persons, including 40 ranchers. This was done to check a representative sample of attitudes, values, and economic situations. A 100 percent sampling would have been prohibitively expensive and unnecessary to arrive at valid data.

COLLEGE OF AGRICULTURE AND HOME ECONOMICS

DEPARTMENT OF FISHERY AND WILDLIFE SCIENCES
Box 4901 Las Cruces, New Mexico 88003
Telephone (505) 646-1544

NEW MEXICO STATE UNIVERSITY

62

July 24, 1979

Mr. Larry LaPlant, Wildlife Biologist
Bureau of Land Management
Box 1397
Roswell, New Mexico 88201

Dear Larry:

I am enclosing some comments on the "East Roswell Draft Grazing Environmental Statement." Please pass them on to whoever should receive them.

I hope you, and others, will not take personally my pointed comments about exclosures. Surely, what little is left of sand bluestem habitat could be preserved by keeping grazing relatively light. If BLM can't do that (and not have to resort to a few exclosures of sand bluestem), then BLM won't be able to do much of anything.

The blanket idea that grassland in the shinnery area can not be improved by grazing reduction certainly is a crude one. We have seen quick increases in quantities of sand bluestem in two years in the center of the prairie chicken study area. Whether this resulted only from individual plants completing their growth ungrazed, or from any increase in density, is beside the point.

The state Game and Fish Department did some survey type studies (by Ladd Frary) in the 1950's on their lands near Milnesand, Gallina Wells, and Crossroads. They stopped grazing in shinnery country and the bluestems got so dense that the prairie chickens started to establish their booming grounds outside these pastures. These lands still have a lot of bluestem, although some grazing has been permitted since their original protection in the 1950's.

I am in sympathy with the local ranchers in their concern for short-term economic losses that will result if plans in the ES are implemented. However, profits now are far below potential because of the deteriorated condition of the range. Failure to improve the range would mean that current large losses (in the form of low profits on poor range) would continue indefinitely for present operators and their heirs.

Sincerely,

Charles Davis

Charles Davis, Professor

C.A. Davis 7/24/79

EAST ROSWELL DRAFT GRAZING ENVIRONMENTAL STATEMENT

62-1 1. Last bibliographic entry under C.A. Davis (p.R-4) is not really C.A. Davis. I do not know who the author is.

62-2 2. Some citations, e.g., "BLM(1978)" gave nothing listed under References for the reader to refer to.

62-3 3. Page 3-9 (Brush Control) says shinnery oak is not proposed for control (3rd paragraph). Dense infestations of shinnery, accompanied by shortage of bluestems, provide very poor habitat for lesser prairie chickens.

62-4 4. Vegetation (pp. 2-2 and 2-3). Designation of this entire area as shortgrass prairies seems a great oversimplification. There is quite a bit of sandy land that supports taller grasses, e.g., the bluestems mentioned in the species list on page 2-2.

62-5 The descriptions of original landscape and vegetation at the top of page 2-3 seem a bit oversimplified. Much BLM land (e.g., Mescalero Sands; area along southern part of Eddy-Lea County lines) is sandy, not so flat, and supported taller grasses.

5. Ecological Climax Communities (p.2-6). The statement (4th paragraph) that "The dropseed-bluestem grasslands would dominate the majority of the ES area..." seems accurate to me. Yet, the previous general description (pp. 2-2 and 2-3) seem to stress flat country and short grasses (which is entirely different).

62-6 6. Prairie Chicken Nesting (p. 2-18; 3rd paragraph). It is not quite accurate to say that "...only well-managed grasslands are used" but it would be very accurate to say that only relatively high quality tall grass areas provide enough nesting success to ensure perpetuation of prairie chickens on BLM lands in New Mexico.

62-7 The 3rd paragraph on page 2-18 should be completely rewritten after review of the final report on the prarie chicken study.

7. Page 3-9. Third paragraph -- Good luck with all that shinnery! There go the prairie chickens.

8. Livestock Exclusion Areas (pp. 3-15 to 3-17).

62-8 (a) The idea of placing these exclosures where the quality grassland dow exists is in direct and complete conflict with the ideas of improving and maintaining the overall range. It implies clearly that

Response 62-1

Reference should have been to Johnson, R. R., and D. A. Jones, Technical Coordinators 1977. This has been corrected on p. R-9.

Response 62-2

All BLM references cited are listed under U.S. Department of the Interior, Bureau of Land Management (Page R-20) with the exception of BLM (1978), which, at the time of preparation of the DES was in preliminary stages. This reference has now been changed to reflect material accomplished by NMSU for BLM under a contract with that institution (see page R-13).

Response 62-3

There were various reasons for not proposing programs to control shinnery oak based on the multiple-use planning process. However, based on the analysis contained in this ES, these reasons will be reassessed prior to formulating the final decision.

Response 62-4

The use of the term "shortgrass prairie" is used to describe the larger expanse of country which includes west Texas and eastern New Mexico. It should be understood that any large general description of the vegetal province will include several smaller areas which include different vegetal types. Through the use of the Range Site Visual provided with the DES, the relative quantity and distribution on various historic vegetative subdivisions can be determined.

Response 62-5

The vegetation descriptions on page 2-2 and 2-3 do not state that the entire area is a shortgrass prairie. It says that less than 10 percent of the area is shortgrass grassland. As shown on page 2-6, midgrasses such as bluestems, and dropseeds would be dominant on 920,000 acres if brush invasion had not occurred. Thus, these lands are not considered midgrass grassland but are considered mesquite aspects and shinnery oak aspects.

The description of the original landscape and vegetation at the top of page 2-3 states that there are sand hills and plains. The mention of "high arid plains" is a quote from Lt. N. Michler, Jr., describing the eastern part of the ES area. The Mescalero Sands are predominantly barren sands and cottonwood trees. There are few areas which support large areas of grass in the Sands. The Eddy and Lea County line area is predominantly a shinnery oak aspect which is hummocky. The grasses present are bluestems and dropseeds. When grasses dominated this area in the past, it was flatter. The hummocks and dunes are not believed to have been present at that time. These hummocks and dunes give the country a rolling hill aspect.

62-8 cont. you plan to allow heavier grazing on the remnant few square miles of quality bluestem now existing. A much more professional and honorable approach would be to protect all the existing sand bluestem area from deterioration by carefull control of grazing. There is little enough sand bluestem already.

(b) The exclosures should be placed in areas where the sand bluestem has experienced some reduction, although admittedly not where shinnery has taken over completely. The rhetoric about how relief from heavy grazing won't help grass recovery is beside the point in relation to areas where shinnery infestation is not yet extreme. In many areas, where considerable ground is not yet taken by shinnery, bluestems will spread under protection.

Even if bluestems can not displace shinnery, they can produce tremendously more growth where ungrazed, and the shinnery areas are where this is needed. A visit to some of the prairie chicken restoration areas (state Game and Fish Dept.) around Milnesand would be instuctive in relation to effects of relief from heavy grazing.

It really is very inadequate to plan for only the amount of quality bluestem (especially sand bluestem) cover than can be supported in a few scattered exclosures.

Response 62-6

This is a valid criticism. The paragraph concerning prairie chickens has been rewritten to read: "Intensive inventories during the spring of 1979 revealed that there were 32 active leks (booming grounds) of the lesser prairie chicken. Approximately 336 males were observed in display. Booming grounds are abandoned oil pads or shortgrass outcrops within the shinnery oak community. Nesting habitat is critical since only relatively high-quality tall grass areas are used. At least 57 percent of the plant composition of potential nest sites must be grass with bluestems making up 25 percent of all grass (New Mexico State University, 1979)." (See p. 2-18.)

Response 62-7

Current land-use planning does not recommend control of shinnery oak in the prairie chicken area. However, recent information and analysis of the impacts have shown that a reduction in the density of shinnery oak is necessary to improve range condition. It is possible that shinnery oak may still be controlled in the chicken area since final decisions have not been made.

Response 62-8

The placement of some exclosures in existing good quality bluestem areas would not pose a threat to nesting habitat when other factors are considered. Nine allotments are scheduled for exclosures and of these nine, six would have an average AUM reduction of 37 percent. Three allotments would have average increases of 21 percent. These changes in AUMs, coupled with light utilization of bluestem (25 percent), periodic rests, and, perhaps, shinnery oak control, would increase nesting habitat in both the short and long-run.

64

Box 1124
Hobbs, New Mexico 88240
July 25, 1979

Tom Riddoo
Public Affairs Specialist
Roswell District, BLM
P. O. Box 1397
Roswell, New Mexico 88201

Dear Sir:

I find myself in a dilemma trying to keep my reply shorter than the monstrosity causing my concern, East Roswell Draft - Grazing Environmental Statement. In my attempt to be more brief I would like to address five areas of the document.

1. The Bureau of Land Management choose Allotment Management Plans or "Specific Grazing System," their new alias, to implement the proposed programs and repeatedly stated that the plans would be jointly agreed upon whenever possible. 64-1 This is illegal according to the 1978 Amendment to the Organic Act. If the legalities were observed, why would a permittee agree to a "Specific Grazing System" when 1. out of the 20 permittees with AMP's received allotment cuts and the 10 referred to in Table 1-6 received cuts averaging 38.44% of their grazing perference or actual permit. This is the equivalent of hiring an unqualified manager with bad references at a prohibitive cost.

2. The methods used in the Environmental Impact Statement are disgraceful especially with the outcome causing disaster in the ranching industry both as a whole and on an individual basis. The only way to properly conduct a range survey of this type is over a long period of time encompassing weather cycles. 64-2 Instead 1977 was chosen when rainfall was almost non-existent with spot checks in 1978 when rainfall was minimal and late.

3. The East Roswell Draft - Grazing Environmental Statement is a biased presentation. Ranchers have more interest in conserving the land than anyone. Land is the primary source of our income. In 1977 most herds were smaller than

Response 64-1

See Response No. 14-2.

Response 64-2

See Response No. 7-1.

normal due to the dry range conditions. Rather than acknowledge rancher conservation, livestock numbers for 1975, 1976, and 1977 were averaged to derive "Active Licensed Use." "Active Licensed 64-3 Use" enabled the BLM to show a proposed reduction of 28% instead of the true 40% reduction when calculated from Grazing Preference. Grazing Preference is based on a range survey conducted in 1940 and 1941.

4. On page 2-3 of the Environmental Impact Statement appears; "Production of the total vegetation complex was not measured in this inventory." Yet economic disaster is proposed 64-4 for ranch families in the area. There are many species of valuable forage for livestock grazing other than primary grasses. It would seem that the purpose of the impact statement is to eliminate livestock grazing on the public lands rather than analyze it.

5. An enormous program for brush eradication and range 64-5 improvement has been proposed with little or no mention of costs and funding. Where are the funds to come from? Can the BLM guarantee the funds will be available when needed to implement the proposed action? What will the program cost? Has a cost-benefit analysis been done? It is shocking that a proposal of this magnitude would leave these questions unanswered.

My wife and I have two children ages 12 and 16. It is not hard to imagine our dismay when we were told that the BLM proposed to cut our allotment 57% for 20 years. Our first thoughts were: What will we do if there is illness in the family? How will we educate and provide for our children? The BLM said to get a job. I live 35 miles from the nearest town, will be 40 years old in 1980 and have experience in ranching. If a note of anger is detected in my comments - so be it. In the year 2000 after the proposed miraculous restoration of the public land my allotment according to Table C-3, would lack 506 AUM reaching my present grazing preference.

Sincerely,

William C. Smith

William C. Smith
Allotment #6021

Copies: Senator Pete V. Domenici
Senator Harrison Schmitt
Congressman Harold Runnels
Congressman Manual Lujan
Mr. Art Zimmerman

Response 64-3

The percentage of reduction is only a means of describing the change. Realignment of the stated stocking rates with the forage production which is properly usable by livestock, is the real issue involved. Whether that results in a 28 percent change from licensed use or, as is stated by this comment a 40 percent change from preference is immaterial in regard to proper stocking levels. From an economics standpoint, licensed use over a 10-year average has been even less than the 3-year average. Reductions due to dry conditions are not evident.

Response 64-4

See Response No. 7-1.

Response 64-5

Actual project layout and design has not yet been accomplished and would be necessary to determine actual cost of the program. However, estimates indicate that the cost will be approximately 10 million dollars when all of the projects proposed have been completed. If all projects are to be completed, funding would have to be appropriated by Congress. There is no guarantee that these funds would be available when needed, and improvement of forage production on these rangelands would not be expected without the projects. A cost-benefit analysis would be completed on each allotment prior to conducting any vegetative treatments or other improvement projects.

65

July 25, 1979

Dear Mr James O'Conner

I have gone through the East Roswell Grazing Environment Statement, and as a rancher I have to say it looks like the BLM is trying to put the rancher on the endangered spieces list! I wonder if they would show me some concern after they got us on that list? This impact statement if passed in this form will do to part of the ranchers in this area what droughts, low cattle prices, hail and many other disasters have not been able to do, that is to put them out of ranching competely! These are men with an average age above 50 years. What are they going to d.? Who wil going to give them a job?

The BLM says the economic impact the the area will be negligible. How can you lose 1.5 million dollars per year out of the economy of Southeastern New Mexico and not feel it? I am tired of hearing people say the rancher is raping the land that we take our very existance, and for the most part apoor existance! I plan to spend the rest of my life on my ranch, so I am sure not going to rape it! I plan to leave this ranch to my children some day but in the meantime I will try to teach them to love it and take care of it as their dearest possesion. Most ranchers I know hold these same ideas.

As to wildlife the rancher maintains waterings these aninmals use. If it were not for these waterings wildlife sould be in bad shape. Most ranchers want some sildlkfe on their ranches. We might even get more pleasure out of wildlife than most sportsmen.

65-1 The way the grass surverys were done in the East Roswell Impact Statement is a disgrase to any good range mangement specialist. No transects were permanehtly marked. No one can go back to check this work. The statement was done on a very 1 year and no good study can be based on a 1 year study. There are too many variations to consider.

I don't understand how the goverment can say on one hand the world is starving and we must do something to help, and on the other hand try to cut cattle numbers on public lands by some 28% according to BLM figures. I think it comes closer to 40% cut in cattle numbers.

In closing I request more comment time to this document. BLM worked 3½ years to prepareit and they give the public 7½ weeks to study and comment. It looks to me like they are trying to run a railread.

Sincerely, David

Response 65-1

See Responses No. 7-1 and 27-2.

66

J^ly 25, 1979

Dear Mr. James O'Conner

I have just finished looking through the East Roswell Grazing Environment Statement.

1. Economically, I think it will be disastrous ! It will put many ranchers out of business. It will not only affect the rancher but the community, state, and nation, because this will decrease cow numbers which in turn will cause higher beef prices. How would you feel if someone came to you and said your present salary would be cut by 20% to 50% for the next twenty years. Idon't think anybody in his right mind would stand for this, but this is what the Bureau of Land Mangement is asking of the rancher.

66-1 2. We personally never saw the people who ran the soil and range study. There is no markers where you can go back and check to see if there is any improvement. I thought this was the main purpose of the study.

3/ As far as your multiple use system, if it were not for the rancher supplying water through windmills, and dirt tanks there would be no wildlief. I think it is about time you put people before some endangered animal.

4. As for your opinion of the ranchers values I believe you are mixed up." My Husband and I have had to take a part time job in town to make ends meet because we have had to cut down on our cow numbers because of the drought and low cow prices. We try to take very good care of our range because that is where our living comes from. Yes we as ranchers are independant and proud. But you must take note that there is no rancher on welfare!

5. I really think my tax dollar could be put to much better use than on these useless studies. I also want to add that a program such as this and the AMP the BLM want is not much different from Communism!' It is really a shame when the goverement tells you what to do, how to do it and when to do it!

6. In closing I will state that the East Roswell Grazing Environmental Statement is 100% wrong.

Sincerely

Anita Carpenter
+A Ranch Permit

Response 66-1

See Response No. 27-2.

70

Malcolm R. Madera
Box 94
Orla, Texas 79770

July 24, 1979

Mr. James H. O'Conner
District Director
Bureau of Land Management
P. O. Box 1397
Roswell, New Mexico 88201

Dear Mr. O'Conner:

Enclosed please find a copy of a letter that was written to Mr. Tom Kiddoo concerning the East Roswell Draft Grazing Environmental Statement.

70-1 It is difficult to be objective and detached enough to make responsible comments on proposals of this nature. I feel that this survey was taken quickly by young people that were untrained and unfamiliar with the ranching operations as well as land and forage in our area. I do not think that they took more than a small portion of the pertinent factors into account before making recommendations that would drastically alter our very way of life.

This is supposed to be a country dedicated to liberty and the pursuit of happiness yet one small group of people is trying to tell us that, after spending our whole lives as ranchers, we must take outside employment, submit to governmental regulations in our businesses as well as take a huge financial loss.

Their thinking is so unrealistic that I can hardly contain myself. Even if I took an outside job to supplement my income, with the fuel situation the way it is imagine what it would cost to commute 120 miles a day to the nearest town for work and what type work could I do. How many people in town want to hire a rancher? Who do they think will take care of the ranch while I am working elsewhere? Even if I run only two cows on my entire ranch I have the same amount of fence to keep up, the same wind mills to repair, the same amount of land to oversee. Could they expect to continue their full time job without pay and hold down another to support themselves while waiting ten or twenty years for their former job to start paying again? They would think that anyone that suggested this had taken leave of his senses! This is the ranchers feeling at the present toward the Bureau of Land Management . . . they must have taken leave of their senses!

Any action you might take or influence you can bring to bear to help us preserve our way of life as well as a lifetime's financial investment will earn our undying gratitude.

Sincerely yours,

Malcolm R. Madera
Rancher

Enclosure

Response 70-1

The individuals involved in sampling the vegetation in the forage survey were trained in plant identification and forage sampling procedures. Knowledge of ranching operations for the express purpose of making a forage survey is not a requirement. To conduct a survey of production, it is primarily necessary to be able to identify the plant species and be able to both measure and estimate their production on the site being sampled (an ability which was developed in the area which was to be surveyed prior to beginning the survey). The factors that they were instructed to consider were: the stage of growth, percentage of utilization, and percentage of growth present, compared to normal.

Malcolm R. Madera
Box 94
Orla, Texas 79770

July 24, 1979

Mr. Tom Kiddoo
Public Affairs Specialist
Roswell District, BLM
P. O. Box 1397
Roswell, New Mexico 88201

Dear Mr. Kiddoo,

I have been ranching for the last 47 years and have never, in all my past experience, been confronted with anything that I considered as much of an insult to my ability as a rancher and supposedly acquired expertise as the recently compiled draft environmental statement concerning grazing management in the East Roswell area. Listing each impossibility of proposals as well as inconsistancy of goals would result in a charge as long and ridiculous as the original draft. I, therefore, will waste neither your time nor mine in attempting such a feat.

I would like to comment, as simply as possible, on my present operation verse your supposed intentions and why I, as a rancher, feel your approach is unrealistic. I assume you want the land that belongs to the public utilized to its fullest potential while keeping it in the best possible condition. Can you seriously doubt that that is also my objective since my livlihood depends on the same goal?

An example of my operation would be a lease I purchased in 1936. Under the Taylor Grazing Act and later the Bureau of Land Management, I have a 300 head allotment. The time it was acquired followed the drought of 1932 through 1935. At the time of acquisition there was no grass there and even though I needed the space I did not put a single cow on it until 1937 after I felt the rain had brought back enough grass to accommodate 100 head. I gradually increased this number as the grass improved until I was running approximately 200 head. This was only 2/3 of the allowed allotment but the grass coverage, in my opinion, was inadequate for more cattle at any time during the following 15 years. The drought of 1952 through 1956 in that same area of 25 sections finally reduced me to running a grand total of 12 head. This was not due to good prices at market, as I remember selling cattle during this period for $65 a pair. It was simply due to concern for the land. After that drought I again started restocking, slowly, and always with the protection of the land in mind. When the rain is slow to come we use supplement feed such as molasses, cotton seed cake, etc., to avoid undue strain on the grass. We are trying to raise beef to feed a nation, not a boastful number of skinny cows to feed our egos and this cannot be done on poor land.

If you owned a shoe store and applied for a loan at the bank to help you restock after a fire destroyed most of your shoes, would you expect the banker to come to your place of business and base his decision of your ability to repay that loan by looking at the inventory you had left to sell? Of course not, but in essence this is what you did to us. You ran your survey and based your decision of how many cattle we could run and the care we were taking of our land by counting blades of grass in our pastures during a time that we were a draught disaster area. Do you realize that survey was done while, to the best of my knowledge, the government had made only its second offer of financial aid for supplemental feed to get the same people you were surveying through an emergency situation? What would the results of your survey have shown if you had run it after a good rainy spell instead of during a drought? Would you have increased the allotments you left as they were, or possibly left the ones that you instead cut? When making your decisions, how many ranchers did you ask about the rainfall they had had in their pastures during the past year and if it had been during the warm weather to promote growth? No one I know of! Surely a responsible person would base the decision of any business's potential on the records of several years, not just a few random days observance. As far as I know, not even God can make grass grow without rain and sunshine!

The draft mentioned spending approximately $10,000,000 on 184 allotments. Granted, this sounds like a lot of money until you consider that it would be just under $55,000 per allotment. You suggest using chemicals to kill the brush, thus increasing forage. The only spray that I know of that will do this is illegal to use in New Mexico and a small pasture I sprayed in Texas cost me $5,000 each of the two times I sprayed it. The first time had no effect and the second time seems to have been only partially successful. Ignoring the legalities and, assuming none of this money was going to salaries and was all to be fed directly into land improvement, it still wouldn't even start a project of this scope.

If you think I sound bitter and skeptical, you are right, I am. When, after spending a lifetime of watching the sky for rain, praying for wind to turn the mills, fighting a wolf or coyote for a baby calf, working your heart and guts out to get your cattle to market so you can sell them for less than it cost to raise them, then having a group of government surveyors come in, (the one I happened to run into wasn't even familiar with the native grasses in our area), to tell you that you don't know what you are doing . . . well you might be a little bitter and skeptical too.

This is my report. It cost a couple of sheets of paper, an envelope, a fifteen cent stamp, and a life time of hard work. What did the Bureau of Land Management's report cost?

Sincerely yours,

Malcolm R. Madera

Malcolm R. Madera
Rancher

CC: Mr. Art Zimmerman
Mr. James H. O'Conner
Honorable Pete V. Domenici
Honorable Harrison Schmitt
Honorable Harold Runnels
Honorable Manuel Lujan

July 26, 1979

Mr. James H. O'Conner
District Director
Bureau of Land Management
P. O. Box 1397
Roswell, New Mexico 88201

Dear Sir:

Regarding the Chaves, Eddy and Lea Counties Environmental Draft, please be advised that as a private citizen I wholeheartedly endorse the attitude and reasoning of the Southeastern New Mexico Grazing Association in opposition to your planned ideas and methods to reduce animal grazing allotments.

74-1 Your Bureaucratic dictatorship should be disolved immediately! Any reasoning used by you and the Bureau of Land Management to absolutely control ALL lands being used for the same animal grazing is outrageous. The forced control of deeded or contract-purchased or State leased lands by the BLM constitutes a direct violation of our Constitutional rights.

I respectfully ask that you as the District Director, take a second look, through use of competent land users as advisors rather than through your less informed personel, to properly advise those persons in Washington, D. C. of the actual needs of present landholders and permittees. This might also include per your remarks , that the abuse of the Federal Lands is very low percentage.

Please reconsider and admit that you can make mistakes. Listen to the people!!

Sincerely,

C Stuart Moats

C. Stuart Moats
703 So. Plains Park Dr.
Roswell, New Mexico 88201

cc: Honorable Sen. Pete V. Domenici
Honorable Sen. Harrison Schmitt
Honorable Rep. Harold Runnels
Honorable Rep. Manuel Lujan
Mr. Art Zimmerman, State Dir. of BLM

Response 74-1

The proposed action provides for private or state lands to be managed separately from public lands, should the state or private entities so desire. However, should they choose to use the area in a consolidated manner, compliance with the provisions designed to protect resource values on the public lands would be required. This includes stocking levels and certain aspects of grazing systems such as minimum rest requirements. Constraints placed on intermingled, unfenced, non-federal land would be limited to actions necessary to properly manage the public lands. (See discussion on page 1-33 which gives the interrelationships between the State, private, and public lands).

DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1580
ALBUQUERQUE, NEW MEXICO 87103

76

SWAED-EP

25 July 1979

Mr. Tom Kiddoo
Public Affairs Specialist
Roswell District, BLM
P.O. Box 1397
Roswell, New Mexico 88201

Dear Mr. Kiddoo:

We have reviewed the draft enviromental statement concerning the Bureau's proposed livestock grazing management program for the east Roswell area of southwestern New Mexico. Generally, the statement is well prepared and accurately describes environmental, cultural, social, and economic conditions and impacts resulting from the proposed action.

Although there are some initial adverse impacts resulting from the proposed land management measures, most resources and especially the livestock industry should benefit as a consequence of long-term management methods. The watershed improvements and resulting decrease in soil erosion should benefit stream channels through a reduction in sedimentation and corresponding improvements in hydraulic efficiency, bank stabilization and sediment transport, subjects of significant concern to the Corps. Also aquatic habitat should improve.

The statement details initial and long-term adverse impacts to a certain segment of the wildlife community that would result from brush control
76-1 measures. Realizing that these areas were originally grassland and that other wildlife benefits are occurring, the extent of these brush control measures should be carefully weighed in relation to benefits and overall ecological diversity, productivity and stability. Also, the long-term effects of herbicides should be carefully monitored.

We appreciate the opportunity to review and comment on your proposed grazing management plan.

Sincerely,

JASPER H. COOMBES, P.E.
Chief, Engineering Division

Response 76-1

As stated in the vegetative portion of Chapter 3, page 3-3, it is not expected that the overall vegetative aspects would be changed due to brush control measures (overall 40 percent control). Therefore, ecological diversity should be improved rather than restricted. Monitoring of the effects of herbicide applications would be accomplished as described in Chapter 1. (See page 1-23)

SAND RANCH
P.O. Box 747
Clovis, N.M. 88101

The Sand Ranch grazing program was originally set up in the year 1970 and revised in Janurary 1975 by the BLM with an alloted permit of 250 head. This program was planned with a set aside, pasture by pasture, ideal based on plant cycle, spring growth and seeding; evidently without consideration of scattered showers and moisture. As an example: in Clay-Pits during 1978 we received 24 inches of rain. At the corrals between South Meadows and Westfall the rainfall was 17 inches and at the corrals between Crosby Tanks and Westfall the rainfall was 20 inches. This program is set up to cover from 1975 to 1984 and was to improve range conditions to give us a grazing capasity of 280 head by 1984. A figure that is essential to the financial soundness of Sand Ranch.

South Meadows was set up in 1975 at 516 aum's; with a carrying capacity of 43 head. This pasture has a considerable amount of what is known as Mescalero sand, which when heavily grazed has a slow recuperative potential. It was set up for constant grazing, with the exception of the shinney season; from the start of the grazing system, Janurary 1975 until March 31, 1979.

> Because of the grazing program deficiency, this pasture was overgrazed; while in the meantime Westfall pasture was out of our grazing program, "and is one of our better pastures," with a percentage of tight land and sand country.

Through conservation practices of our own South Meadows was not grazed from October 1977 thru the time of this writing July 25, 1979. With the exception of two weeks July 1, thru July 15, 1978 and December 15, thru Janurary 1, 1979. These periods were grazed for tromp and seeding to help regain our normal pasture. BLM records will show a great improvement in this pasture. Beceuse of our own practices and conservation, not the program outlined by the BLM.

Eastfall is another example of moisture deficiency; as with South Meadows it received approximately 17 inches os rain. This pasture was the only one available under our grazing program for our keeper heifers. Our main cow herd is breeding to Beefmaster bulls, our heifer herd is bred to Brangus and Galloway bulls. The Beefmaster bulls weigh approximately 1300 lbs. It is completely unfesable to run these bulls with keeper heifers weighing 650 lbs. Therefore some overgrazing was done on this pasture. It would have been far worse if it had not been for the consideration granted by Katy Galassini and Paul Jancar of the BLM to let us graze an alternate pasture.

The next pasture was Headquarters, with an alloted 33 head and 396 aum's. Headquarters was set aside the 31th of March, 1978 for a total of 16 months. Time and numerious experiments by different conservation agencys, have proven that for proper seeding you must have tracking or tromp to seed-in mature seed; and it is also proven that cow tracks, horse tracks, deer tracks, and etc; not only plants mature seed, but catchs rain and snow to nuture the planted seed. This was accomplished and tha facts are available from BLM records. This pasture is now carrying 67 head of heifers and a person cannot even tell that they are there.

Westfall pasture has an allotment of 708 aum's and 59 head. It also was on a 16 month set aside program from April 1, 1977 until August 1, 1978. (The main period that South Meadows was being overgrazed and the same time that the BLM was taking it's first range survey. It is no wonder that South Meadows was given such a low rating.) This is undoubtably the best large pesture on the Ranch; with the main percentage tight sand and some tightland flats.

Crosby Tanks is the largest pasture with 744 aum's and alloted 62 head. Because of the overgrazing of South Meadows, and our voluntary resting of it, Crosby Tanks was stocked with the main herd of 188 head from October 22, 1977 until April 1, 1978. This is a very good pasture and carried the load without any visable signs of overgrazing. It was voluntarily rested from April 14, 1978 until July 1, 1979 for spring growth and seeding. It is now restocked with approiximately 85 head.

We are in the process of building one of the best Beefmaster herds in the Eastern New Mexico. If we are forced to cut our herds, as BLM is intending, it will force us to stop the selective keeping 7-1 of our heifers and therefore ruin our future herd plans. Every cow on this ranch will have to be a producing unit.

This is one thing not brought out by the research done by BLM. Whereas we have been keeping out approximately 30 head of heifers, weighing on a two year average 650 lbs. We will have cows weighing 1000 lbs. for those two years plus a calf by her side. I think you can see the differance in the pounds of tromp. Even this will cause great hardships. It will force us to buy grown cows every year with uncertain pedigree and more uncertain calves inside.

It is also quite evident that financial disaster could be brought

Response 77-1

Impacts on livestock herds as a result of the changes ranchers choose to make in response to economic effects of the proposed action have not been specifically analysed. The reason for this not being done is because it is expected that each rancher would make adjustments on an individual basis and therefore it would be nearly impossible to cover every situation. The method described in this comment is a way ranchers may choose to increase their ranch efficiency during the reduced stocking period. A discussion concerning ways ranchers could seek to continue in business is presented on page 3-63 of this document.

about by the planned cut by BLM. We could not even sell this ranch of 25 sections with just a 154 head allotment.

It is also evident from the BLM survey that whoever made the survey did not understand the Southwest. On this land a person could have grass stirrup high; then have prolonged drought and take it flat to the ground in three short years, and the more cattle a ranch had on it, i.e., the year 2000; the worse it would be, not just for that ranch, but for the whole cattle industry. There would be more cattle a ranch would have to sell on an already glutted and depressed market.

With proper management SAND RANCH could graze the 280 head that is the goal set for Sand Ranch by BLM, right now, at this time, 1979. In the ten years of ownership we have never been forced to supplemental feeding. This should say a great deal for the quantity and quality of the forage available on Sand Ranch. It is absolutly impossible for any mortal man to say that this pasture will do this or that pasture will do that. There is but ONE who can say what will happen year to year, let alone 20 years in the future. The next closet one is the rancher himself, who knows where the moisture fell, how much, and can graze his herd accordingly.

77-2 Sand Ranch was grossly and unfairly surveyed. We will do everything we can to see this situation corrected.

Sand Ranch
Edwin N. Whitten Mgr
Edwin N. Whitten

Response 77-2

See Response No. 7-1.

COOPERATIVE EXTENSION SERVICE
NEW MEXICO STATE UNIVERSITY
BOX 3AE, LAS CRUCES, NEW MEXICO 88003
COLLEGE OF AGRICULTURE AND HOME ECONOMICS

78

July 25, 1979

Mr. Tom Kiddoo
Public Affairs Specialist
Roswell District, BLM
P. O. Box 1397
Roswell, NM 88201

Dear Mr. Kiddoo:

We appreciate the opportunity to comment on the East Roswell Grazing Environmental Statement. The Bureau is to be commended on their attempt to survey, record, and complete the Environmental Statement in the time period that was available. It is evident that much effort has been invested in the preparation of this statement.

The following comments were prepared by the Range Improvement Task Force at New Mexico State University. The Task Force is an interdisciplinary team of specialists in Range Ecology, Range Brush and Weed Control, Wildlife, and Economics. Additional inputs were received and incorporated in the statement from faculty members of the New Mexico State University College of Agriculture.

The comments are intended to be directed at the processes and methods in the draft statement, and are not directed toward any one individual or individuals within the Bureau of Land Management. When individuals or an organization expend as much effort and time in a project such as this Environmental Statement, any criticism of the statement many times is confused with criticism of an individual or organization. We trust that these comments will be received in the light of addressing the process and not be taken personally by anyone within the Bureau of Land Management.

Respectfully,

Jerry G. Schickedanz

Jerry G. Schickedanz, Coordinator
Range Improvement Task Force

JGS:dra

Enclosure

New Mexico State University is an equal opportunity employer. All programs are available to everyone regardless of race, color, or national origin. New Mexico State University and the U.S. Department of Agriculture cooperating.

An Analysis of
The East Roswell Grazing Environmental Statement

by

Range Improvement Task Force
New Mexico State University

While parts of the East Roswell Draft Grazing Environmental Statement
78-1 (ES) provide an excellent base for initiating planning, the draft ES does not provide adequate justification for the severe consequences that will result from its implementation. The Bureau of Land Management (BLM) is charged with considering the many and varied uses of the public lands, but there is no guarantee that some of the management proposals will not detract from the very uses they are intended to enhance. The BLM would be well advised to proceed carefully to insure that problems are solved rather than new ones created.

The BLM is to be commended on their efforts to survey, record, and complete the draft ES under extremely tight time restraints. The Bureau, however, has had almost four years to prepare this Environmental Statement. After the draft statement was issued on June 15, 1979, the public had only 32 days to review completely and digest the material prior to presenting oral comments. Only 45 days will have elapsed when final written comments are due. Preparation of the ES document was obviously done with painstaking care; analysis of the contents of the document should be conducted with at least the same degree of precision. We request that at least a 90 day extension of time be allowed in order that the Bureau might receive the type of public input that will provide assistance in revising the final draft into an acceptable statement.

The National Environmental Policy Act (NEPA) states that ES's are to be comprehensive, objective studies and not post hoc rationalization for fully

Response 78-1

The proposed action is the result of the Bureau Planning System as emphasized on pages 1-1 and 1-2 of the document. The trade-offs resulting from the planning system are summarized in Table A-23. The purpose of the environmental statement is not to be a justification for the proposal. As provided in Public Law 91-190, the National Environment Policy Act of 1969, the purpose of this statement is to analyze all proposed federal actions significantly affecting the human environment. The statement provides an analysis of the environmental impacts of the proposal, thus providing the decision-maker and the public with a full disclosure of the environmental consequences should the proposal be implemented. The decision-maker can then use the analysis, along with public comments and other pertinent information in arriving at a management decision.

78-2 and finely made programs. We feel that the initial draft of the East Roswell Grazing ES may violate the basic premise of NEPA by attempting to justify what appears to be a BLM preferred program. We believe that other alternatives must be studied and reported which realistically address the complex situation

78-3 in the ES area. For example, alternatives that include brush control, with or without management plans or with or without livestock cuts, are not presented. Because of these deficiencies, considerable upgrading is necessary before this document would be suitable for a final environmental statement.

78-4 There seems to be nothing wrong with the basic field procedures for the collection of vegetative production data in order to estimate carrying capacities. However, users of such information need to be aware of the limitations. Production estimates from a one-year observation are not adequate for predicting future carrying capacities. The inventory was conducted during a droughty period in the Roswell ES area. From the Methods section, it cannot be determined that allowances were made for these dry conditions. Carrying capacity based upon production during a wet year will be very different from those conducted during a dry year.

The actual amount of variability in the production estimates cannot be determined from information presented in the ES. However, an example of the variability is shown in Table 1-5, where variation around the mean runs up to plus or minus 100 percent in production estimates on unsprayed plots. These types of problems must be considered in determining base carrying capacities. We do not feel that the carrying capacity estimates are totally representative of the long-term average without more information on variability during the initial sampling. A one year or single inventory can only reflect carrying capacity for that particular year. We recommend that inventory data be used as baseline information, but that carrying capacities be developed over time

Response 78-2

The proposed action is the result of the Bureau Planning system as emphasized on pages 1-1 and 1-2 of the document. The trade-offs resulting from the planning system are summarized on Table A-1. The proposal, then is BLM's "preferred program" for range management in that, while taking multiple-use constraints into consideration, the range management objectives may be met in what was considered to be the most efficient and timely manner. The analysis contained herein may result in a modification of the proposal prior to a decision being made.

Response 78-3

As stated in Response No. 78-2, the proposed action is the result of the Bureau Planning system. The alternatives are also the result of the same system. They are composed of resource recommendations which were not carried forward as the "preferred program." While the suggested alternatives were not specifically named and addressed in the document, they are components of the proposed action and alternatives. The District Manager, in making the management decision, can select portions of the proposal and the alternatives, so long as the decision is not in conflict with current legislation, regulations, or policies. BLM policy requires that proper grazing management programs be developed before large investments can be made in a range improvement program.

Response 78-4

The methods used by Leifeste (1971) to determine production were not the same as those of the survey that was employed in determining the forage production on the East Roswell ES area. Therefore the variability values presented on Table 1-5 should not be used to compare with the results of the 1977-78 forage survey.

78-4 cont. and not determined from these data. Carrying capacities need to be developed from trend, actual use, forage production, and utilization studies over the next five years. This would be a more realistic method to arrive at proper carrying capacities.

SPECIFIC COMMENTS

The following comments were proposed to evaluate specifically the adequacy of the Environmental Statement in the fields of brush control, range, economics, wildlife, erosion, and water quality. Although it may be an impossible task to correct all the deficiencies in the short time before the final copy is due, efforts by the BLM should be directed toward protecting all the resources under its jurisdiction.

Brush Control

The proposed brush control program is a positive step towards halting a continuous brush invasion which inevitably will result in further deterioration of forage conditions in the Roswell District. The brush control practices discussed in the proposed action are quite ambitious, and, only with a diligent effort, could they hope to be accomplished by the year 2000.

Certain areas of concern in the proposed brush control program should be addressed. Most importantly, the source of funds for supporting the effort should be identified because this is the major means stated in the ES of improving range condition. Will the BLM incur all costs or will the brush control program be a cost-share arrangement with the ranchers, similar to that used by the Soil Conservation Service? Will funds be sought from the Range Improvement Act of 1978? Projections for improving forage conditions in the

Roswell District with the proposed action are largely dependent upon the
78-5 implementation of the brush control program. If the BLM is not truly committed to the brush control program in terms of guaranteed funding or action, then the Environmental Statement has little validity or purpose.

The specific objectives listed for the brush control program are more conservative than that generally recommended from research and should not be considered as concrete guidelines. The BLM will learn a great deal while using herbicides and it is likely that adjustments will need to be made with the specified application procedures. Guidelines presently employed by the Soil Conservation Service or those recommended by New Mexico State University should be further consulted. These guidelines, developed from research and under practical field conditions, have already been sufficiently tested in the ES area.

Brush control is an art as well as a science. Experience in applying herbicides to different brush species under different ecological conditions is a key to successful brush management. Presently, the BLM is not staffed with a trained brush control specialist. The need for such an individual should be identified.

78-6 Although much can be accomplished through proper brush control in the ES area, many assumptions have been made in the proposal. Picloram as a liquid formulation has not received an approved EPA label for use on New Mexico rangelands. Picloram as a pellet formulation has been cleared for use and is effective on certain juniper and oak species but not mesquite. Dicamba (Banvel) granules have also not proved to be effective for mesquite control and aerial application of this herbicide has not yet been approved in New Mexico. A label is not currently issued for a tank mixture of Picloram and Banvel herbicides. Further, these herbicides in combination have only been tested on a limited basis in New Mexico. The herbicide 2,4,5-T has continually been shown

Response 78-5

The proposed action does not limit the source of funds for carrying out the range improvement projects. However, it is assumed that the majority of the projects would be funded through direct appropriations. This includes the Range Improvement Act of 1978. The proposed action does not guarantee funding because of the nature of direct appropriation funding. The validity of the statement in the absence of funding would be through the selection of one of the alternatives or a combination of the alternatives presented.

Response 78-6

As stated on page 1-13 and 1-14 of the ES, a tank mix of the two chemicals being proposed for use in brush control is expected to be labeled in the near future. No application would be made of chemicals not labeled for rangeland use. Without the aid of these or similar chemicals, the impacts of the proposed action would be similar to those described under Alternative 3; the proposed action using mechanical brush control only. As stated on page 1-26, 2,4,5-T and Silvex are no longer authorized for use by BLM because of possible ecological and environmental effects.

78-6 cont. to be the most cost effective chemical for mesquite control and is recommended for use by every federal and state agency other than the BLM. Why is 2,4,5-T not recommended by the BLM?

78-7 The area of brush controlled in any one year is shown to be no more than 25 percent of an allotment being sprayed. The sprayed area will receive 16 months rest after spraying. Does this mean that after the initial reduction in AUM's from preference numbers, an additional 25 percent reduction will be imposed at the same time? Research in Texas has shown that dormant season grazing (November-March) and deferred growing season grazing improves the vigor and production of warm and cool season grasses by reducing excess standing litter. Therefore, total deferment over 16 months is probably not necessary. Additionally, a properly designed program can be implemented without reducing stocking rate.

78-8 The proposed action presents largely a justification for brush control. More discussion should be given as to how brush control will be integrated with other range improvement alternatives. For example, how can a brush control practice and a grazing system be combined to maximize forage condition for livestock and wildlife? An entire pasture rather than a part of a pasture should be treated at any given time providing the need for fencing to be completed before brush control begins.

Brush management is an ongoing effort that cannot be abandoned as it was
in the 1960's in Roswell. A long-range commitment can return dividends far in
78-9 excess of the do-nothing approach. For the program to work, every opportunity
must be provided to obtain the rancher's alternatives for management. Not
recognizing the rancher as a key element to the success of the brush control
program is a glaring omission in the proposal.

Response 78-7

Yes, there would be an additional 25 percent reduction during the first year of the implementation of a grazing system which requires one or more years of consecutive rest. On systems which do not require one or more years of rest, an additional reduction of 25 percent would be necessary the first year of the spray treatment program. In either case, the full stocking level would be restored following the first treatment.

Response 78-8

Although this document segregates the brush control program from the rest of the proposal, when chemicals are used, to evaluate their direct effects, brush control programs are combined with grazing management in Chapter 3 under the heading "Specific Grazing Management" within each section to evaluate overall effects.

Specific details of areas to be treated and the timing of brush control treatments within a specific allotment will be worked out during the allotment planning process.

Response 78-9

See Response No. 27-2. The rancher would be involved in the development of grazing systems, including development of a successful brush control program.

Range

78-10 There appears to be very poor documentation, from a research standpoint, as to the validity of the time requirements for the rest treatments presented in the proposed action. The objectives of the rest periods are to meet the physiological requirements of forage plants, wildlife habitat needs, and livestock production goals. These requirements are not specifically known for many range forage plants and are very general or speculative for wildlife habitat needs.

The first rest treatment, or four months during the growing season (July through October), seems to fit the Merrill Four-Pasture Grazing System although this is not cited in the references. The four month rest period, during the summer growing season when temperature and moisture is adequate, has been proven to be successful in deferred rotation systems for vegetation and animal

78-11 responses during the last 25 years (Merrill 1954). If four month rest is applied to tobosa and sacaton areas during the summer growing season, problems will develop from non-utilization by livestock during the remainder of the year. The growth form and palatability of both sacaton and tobosa do not allow these plants to be utilized very readily by livestock during other times of the year. Rest during the summer growing season for these plants would be defeating the purpose of a rest period to promote optimum forage utilization and production. Periods of livestock use at other times of the year would be heavier on the surrounding areas than might be acceptable if these tobosa or sacaton areas were not fenced separately.

78-12 The second treatment, or eight months rest, is based on the objective of protecting forbs during the early spring period. Annual forbs, if not utilized at the time of growth, produce little value as forage during the rest of the year.

Response 78-10

In addition to research findings, knowledge of plant growth processes for the forage plants in the area were used to develop time periods which would cover all of the growth and reproduction cycles for the majority of the plants. A common sense approach was used to insure plants an opportunity to regain and maintain high levels of vigor, to reproduce and allow seedlings to become established on most forage species. In addition to plant needs, rangeland needs also were considered, such as providing an opportunity for litter to be deposited, provided an opportunity for improving small wildlife cover and food sources, and to provide for big game forage areas which are free of competition from domestic livestock grazing. The livestock production goal would be a secondary response from an anticipated increase in forage production.

Response 78-11

Tobosa and sacaton can best be managed if they are fenced separately. Often this is not feasible. Where other, more palatable, forage plants are present, management would probably be based on their needs. Even tobosa and sacaton can be expected to benefit from periodic rest during the growing season. Utilization during the remainder of the year would need to be monitored. If a build-up of unpalatable forage occurs, adjustments in grazing systems, or implementation of additional vegetative treatments may be necessary.

Response 78-12

The objective of an 8-month rest period does not specifically include protection of forbs but rather a reservation of forbs for wildlife use (primarily antelope). During most years there is some competition for forbs between wildlife and livestock because they are preferred by both. Forbs often develop before the grasses do and are in a fairly short supply. Use of every area by livestock during this period of the year maximizes this competition. Leaving areas ungrazed minimizes the effect of this competition.

Comments concerning grasses completing two entire growing cycles during one year may not be well founded by research. This phenomenon may only show that the plant did not reach a physiological condition of flowering before dormancy during the previous fall. When adequate moisture and temperature conditions for growth occurred in the spring, these plants produced seed heads. The second set of seed heads observed during the normal summer growth represents the normal growth cycle.

78-13 The third rest treatment or 16 consecutive months appear to fit the rest
rotation system of Hormay. This system has not been adequately researched and
proven successful in the semi-arid Southwest. The additional four months of
rest during the second growing season is noted to be an opportunity for litter
accumulation. Research from Texas indicates that termite use will never allow
78-14 very much litter to accumulate. Requiring 16 months consecutive rest on areas
where cool season species, such as New Mexico feathergrass and needle and
thread grass, have been depleted is very admirable. However, these species
make up a very minor portion of the climax plants on the range sites where
they occur. It may not be an obtainable objective under livestock and wild-
life use to manage for these cool season species. The precipitation pattern
does not lend itself to a very high proportion of cool season species to be
78-15 present in the local plant communities. Recent research on black grama
(Gadzia 1979) indicates that moderate grazing is more beneficial to stolon
rooting than complete rest. Moderate grazing does not significantly remove
the stolons that are in position to root. Soil moisture conditions are very
important in determining whether a stolon will root even if grazed or not.
Therefore, it may not be necessary for black grama to receive 16 months rest
for stolon production and rooting.

Response 78-13

This ES does not address or advocate any one grazing system. It analyses the effect of many treatments which can be used in a number of grazing systems. A specific grazing system would be designed for each individual ranch, these would be developed in consultation with the rancher.

Response 78-14

Indications are that 16 months of rest does provide for the physiological requirements of these species and they can be maintained or increased on those range sites where they occur. Livestock use would fit in with the ecology of the area.

Response 78-15

Although complete rest may not be necessary for black grama stolon production and rooting as Gadzia (1979) indicates alternate grazing for stolon stimulation and rest to take full advantage of soil moisture conditions for rooting would not be expected to be detrimental and would be beneficial on rangelands which are in poor condition, and in areas where black grama plants are in poor state of vigor. Rest periods of 16 months and longer have been identified also to aid in the propagation of plants which develop from seeds, and for increasing the amount of plant litter for soil conservation and wildlife cover.

The fourth treatment, or 20 months consecutive rest, does not show many additional improvements to be obtained.

78-16 The fifth treatment, or 24 consecutive months, in which the objectives are the same as the 20 month and 16 month rest period seem to be excessive rest. A two-year rest period out of every four years would place undue hardship on the intermingled private and state lands. Without additional cross-fencing of BLM lands, livestock removed from BLM land for a two-year period would have to be placed upon private and state lands. This would lead to either complete livestock removal from the range or deterioration of these private and state lands.

78-17 Drought is endemic in the study area as well as in most areas of New Mexico. Can the same vegetational inventory methods that are used in mesic areas be valid in the desert Southwest?

78-18 While it may be biologically necessary to impose grazing reductions on federal lands, it is not equitable that reductions be imposed on state and private lands without some degree of liability. No guarantee appears to be forthcoming in the draft statement that the projected long-term increases in fact will occur. Further, sovereign immunity protects the agency mandating the change from future liability. Forcing ranchers to operate at a loss in the short-run, with no guarantee or recovery of losses in the long-run, patently is not equitable. What compensation is being budgeted for failure to achieve long-run increases on privately-owned lands in the allotment management plans?

Economics

It is apparent that the economic support data used to determine the aggregate figures in the East Roswell Draft are vital in understanding the underlying community stability. These data were not available at the Roswell

Response 78-16

Rest treatments of 24 consecutive months would probably not be used except on allotments that were in poor condition and had a static or downward trend. Normally, these rest treatments can be rotated so that reductions below the initial "proper" stocking level would not be necessary. It is not anticipated that a rancher would knowingly cause the deterioration of his private and state lands by overstocking during periods when livestock would be removed from a portion of the public lands being rested, but would rather work out a total system of livestock management.

Response 78-17

See Response No. 7-1.

Response 78-18

See Response No. 74-1.

District Office of the Bureau of Land Management as stated in Chapter 2, page 40 until late in the review period. Only after this detailed breakdown was provided was it possible to attempt to assess the validity of the methodology used by the Harbridge House in their economic analysis. Even then, evaluation was difficult because the units of measurement used in the detailed breakdown by the Harbridge House were consistently different than those used in the ES. The comprehensive nature of an environmental statement prohibits the development of a defensible analysis if only a cursory examination is afforded. To examine the contents, assimilate the wealth of information, and determine the magnitude and extent of impacts requires longer than the allowed comment period. 78-19

78-20 It is highly inappropriate to conduct the entire document analysis in the designated boundaries of the ES area as defined on page 1-1 and then shift to another geographical area called Southeastern New Mexico to state that the proposed economic impacts are insignificant. The fact remains that in the ES area, ranching remains an extremely important economic activity. It is in this light that the magnitude and extent of impacts should be evaluated.

The Harbridge House conducted a survey during December of 1978 and arrived at the appraised value of $1,000 per animal unit (AU) of grazing on public lands. This $1,000 figure was then used to arrive at the figure of $8 million as the cut in value of ranches in the ES area as a result of the stocking adjustment. Also, a reduction in borrowing capacity by $3.5 million was reported. This analysis was conducted under the assumption (#11) that "capital values of grazing permits would not change with the proposal".

The validity of this assumption was tested during a recent survey conducted by the Range Improvement Task Force. Persons without a vested interest in the outcome were interviewed: ranch appraisers, ranch realtors, Federal

Response 78-19

The ES describes the severity and significance of economic impacts both in terms of the ES area and the region labeled "southeastern New Mexico." Many residents of the ES area work, and shop in communities outside the ES area, such as Artesia, Carlsbad, and Roswell. In order to evaluate aggregate economic impacts on all sectors, it is therefore necessary to base any such evaluation on economic activity in a slightly broader region than the ES area. Nonetheless, the ES is careful to point out the extent to which the ES area itself is dependent on ranching, and the significance of ranges in ranch activity on the lcoal economy of the ES area.

Response 78-20

For the purpose of this study, two areas have been defined, the ES area and the impact area which includes Chaves, Eddy and Lea counties. It was determined that BLM permittees and their operations would be significantly impacted during the proposed action's implementation period. However, when comparing impacts of the range livestock industry with other economic sectors in the region, impacts from the proposed action would be insignificant.

The regional area was studied because impacts are tracked to the point of insignificance. This means that certain impacts are evaluated outside the boundary of the ES area to determine more accurately the significance of these impacts.

The production value of $1,000.00 per AU was held constant in the analysis because ranch sales records on file in the BLM New Mexico State Office, indicate that the per unit values have been static or increasing over the past few years. Likewise, no assumption was made that livestock conditions would change in any particular direction, and there is no guarantee that they will remain constant. Socioeconomic discussions use 1978 as a base year upon which to measure the magnitude of impacts, but the figures used are not perfectly predictive.

78-20 cont. Land Bank credit officers, Internal Revenue Service, and insurance company appraisers.

The results of this survey indicate that due to the (a) uncertainty and (b) the increased regulation associated with BLM management, the value of the animal unit on BLM lands is decreasing. An additional observation afforded by a majority of the informed experts is that: not only is the impact of the BLM management starting to be reflected by a reduction in the market price, but there is also an additional problem associated with "non-salability" of the BLM AU.

The market impact of such a result is basically threefold:

1. The direct economic loss, which was estimated at $8 million, is due to the reduction in AU value and loss of $3.5 million in borrowing potential.
2. A further economic loss is due to a decrease in value of the retained AU's on the ranches in the ES area. The reduction in value would be approximately $200 per AU, for an additional $2.8 million dollar reduction in the value of the retained 14,000 AU's in the ES area.
3. Ranchers have difficulty in selling ranches which are subject to BLM management.

The three aforementioned impacts represent a more realistic assessment of the total range of impact directly affecting the ranching industry in the ES area.

78-21 The East Roswell Draft Grazing Environmental Statement includes only 13 pages of material identified as "Economic Conditions" resulting from the proposed action and alternatives, although numerous economic statements have been inserted in various parts of the manuscript under the various alternatives. For example, in Chapter 5 dealing with adverse impacts, a summary

Response 78-21

Chapter 3 describes in detail the economic impacts summarized in Chapter 6. The conclusions reached in Chapter 3 are supported by the tables and appendices contained in the socioeconomic support document. Altogether, there are more than 100 pages treating socioeconomic conditions in the ES area and in southeastern New Mexico, and the socioeconomic impacts from the proposed action.

paragraph is included dealing with economic conditions. In Chapter 6 on short- and long-term impacts, a page and a section of Table 6-1 include conclusions about short- and long-term economic impacts. In effect, the draft statement contains only summary statements, the validity of which cannot be determined without further evidence.

Socioeconomic Study

78-22 Descriptive sections should be included in the draft statement on how the sample was drawn and whether the sample was stratified by size of ranch for the 40 interviews. Numbers should be included indicating sampling percentages by size of ranch.

78-23 Some divisions should be made of the special study region, because economic impacts of the East Roswell area will have little or no impacts on areas west of a line extending from Roswell through Artesia and Carlsbad. Including entire counties (Chaves and Eddy) will result in a statement that underestimates the overall impacts that will actually occur to those being affected by grazing adjustments.

78-24 There is confusion in the terminology when terms such as "study area", "special study area", and "region" are used. Are they the same thing? Obviously, with only two persons per square mile, the study area cannot be the same as the special study area, with the latter including all three counties.

78-25 What is the basis for the statement that 40 ranch operators were interviewed and 26 key informant interviews were made with Environmental Statement Area permittees in Appendix A? Did 14 of the ranch operators interviewed operate without BLM permits? In Appendix B-1, the operators were categorized as ranchers/ farmers and only one of the 40 interviewed was categorized as a public land permittee. These numbers (40 and 26) should be checked and explained.

Response 78-22

Interviews with ranch operators in December, 1978 indicated that one half lived outside the ES area, mostly in or near Artesia, Carlsbad, and Roswell. Because so many ranchers were residents of these communities, it was necessary to evaluate indirect impacts on the broader economy in terms of southeastern New Mexico as a whole. However, consideration of direct impacts is limited to families of ranch operators with allotments in the ES area, and the focus of analysis is on this group throughout the sections describing social and economic conditions. Details are discussed in the socioeconomic support document, as revised, on file at the Roswell District BLM Office.

Response 78-23

See responses No. 78-19 and 78-22.

The ES Area excludes Artesia, Carlsbad, and Roswell, however, any socioeconomic study must include these communities because nearly half of the affected permittees reside in them. The population of portions of Chaves and Eddy counties west of Artesia, Carlsbad, and Roswell is negligible and would not influence the analysis.

Response 78-24

The section which defines the two geographic areas used in the ES has been rewritten for clarification (see page 2-35). Only two areas have been defined, these include: 1. the ES area as outlined on the visuals, and 2. the special study impact region which includes all of Chaves, Eddy, and Lea Counties.

Response 78-25

Of the 40 key informants in the ranching/farming sector, 26 were BLM permittees in the ES area. Fourteen of the key informants in this sector did not have BLM permits in the ES area. However, they may have a BLM permit outside the ES area.

78-26 Some of the response numbers in Appendix B-1 apparently are incorrect, with 95 responses and only 67 identified on aspects of living liked, 44 responses and only 34 identified on aspects of living disliked, 48 responses and only 22 identified on specific attitudes, etc.

Response 78-26

Some of the responses given did not fall clearly into either the "liked" or "disliked" category, thus causing the discrepancy in the total. A new category entitled "other" has been added to the revised socioeconomic study (support document) to help resolve the apparent discrepancy.

78-27 Table 2-4 is misleading. What does the average mean if different sampling percentages were used on two unequal populations. The raw numbers of each group should be converted to percentages and the percentages weighted for all residents.

Response 78-27

Table 2-4 in the socioeconomic study (support document) has been revised. The column which had been entitled: "average", now reads "average of all residents."

78-28 A basic flaw in the analysis occurs in the capital depreciation costs reported for each size of ranch. Can nation-wide IRS useful life estimates be used for ranch improvements in the Southwest, e.g. 20 years or less for improvements, 15 years for horses, and a variety of years for pickup trucks depending on size of operation? Only the latter is realistic. If fences are depreciated in 20 years, then few fences in the study area have value. Yet the return on investment is calculated on investment being orignal cost. This is a form of double-counting. Ranch assets worth $1,000 with a ten-year life cannot be included as a ranch investment of $1,000 after depreciation has reduced its value to $0. Investment value must include depreciation, or depreciation is meaningless.

Response 78-28

Tables showing ranch budgets by ranch size category in Appendix D of the socioeconomic study (support document) have been revised to permit determination of impacts on net cash income (prior to full allowance for depreciation), and on net business income (with such allowance).

78-29 The differences in "total cost" in Appendix D of the socioeconomic study (apparently total investment) and total investment in Table 2-11 of the draft statement are not explained. The investment in the draft statement is higher than the total cost in the socioeconomic study. The only way that this could occur is if depreciable assets are appreciating at a more rapid rate than the IRS schedule of depreciation. As land and livestock (non-depreciable assets in the socioeconomic study) are 63-66 percent of the total, and the IRS depreciation schedule is artificially high, this event obviously is not occurring.

Response 78-29.

Table 2-7 of the socioeconomic study (support document) and Table 2-11 of the final environmental statement have been revised to stress cash flow rather than depreciation.

78-30 It is interesting to note that capital depreciation is about 40 percent of total costs. With the exceptionally high depreciation rate used in the socioeconomic report as well as the high investment values based on undepreciated values as noted above, ranch returns were reported as being either losses on small ranches or modest returns on medium-size and large ranches. In effect, the estimated impacts of the proposed action and alternatives is being seriously underestimated with these low reported returns. As a matter of record, most New Mexico ranches had losses in 1976, a modest level of returns in 1978, and anticipated high returns in 1979.

78-31 The receipt estimates also contain some unexplained variations. Weights per head were the same for all sizes of ranches (an unlikely event), as were prices received per pound (a more likely event). Calves sold as a percent of cows and heifers were almost exactly the same on all sizes of ranches (66-67 percent). This means that calving percentages, death loss percentages, replacement rates in the breeding herds, and livestock purchases of replacement females all were at the same rates regardless of ranch size (events that do not conform to any known study of ranch size-production relationships). In effect, these errors/rigidities tend to overestimate the incomes and impacts on smaller ranches, and underestimate them on larger ranches.

In the cost estimates, depreciation was discussed previously. Where were 78-32 vaccines and vet fees included in the schedule of costs? These items were included in the interviewer notes under feed. What were the sources used for operating costs per mile or hour of machinery, or for taxes per unit? Land taxes appear to be unreasonably low compared to taxes on cattle. What were the sources used for these estimates? What type unit was used for grazing fees? How were feed costs accumulated, in that ranchers customarily buy hay at one price, and concentrates at other prices? Were repair and maintenance

Response 78-30.

Table 2-11 has been revised to stress cash flow rather than depreciation. This gives a higher return. The methodology used in developing this information is contained in the support document which is on file at the Roswell BLM office.

Response 78-31

The results of interviews conducted for this ES effort suggested that differences in calving percentages and sale weights varies by ranch size. The socioeconomic study (support document) has been revised to reflect these variations.

Response 78-32

Vaccines were included in the ranch budgets as a veterinary cost.

The data used for computing operating cost per mile and taxes per unit was based on direct answers from ranchers. Estimates for "hour of machinery" were converted to "miles" as very few, if any, operators used tractors, etc., on the ranch. Related questions are discussed on pages 78 and 80 of the socioeconomic study (support document.)

The source used for gathering data concerning land taxes was direct answers from ranchers.

The base units for grazing fees are the AUMs, but these units were converted to AUs.

Rancher feed costs were established by asking each rancher the total costs of feed purchased. Each was asked to differentiate the costs of purchases, based on the different kinds of feeds. Interview notes in the support document summarize the actual interviews.

Repair and maintenance costs were not estimated separately. Depreciation costs, in dollars, cover both costs of maintenance and repair of improvements.

78-32 cont. costs estimated separately for improvements, as was done for equipment? If not, why not? Without answers to these questions, the accuracy of the variable costs cannot be determined. No explanations were found in the procedures section of the socioeconomic report.

78-33 In the section dealing with assessment of impacts of the proposed action, what was the basis for the statement that no significant impacts are projected for the families of workers in industries which are economically tied to range livestock production, particularly when returns will decline for all operators from $2.5 million to $748,364. The draft statement indicates secondary impacts are anticipated for these families of workers.

78-34 Comparisons between data in the socioeconomic report and the draft statement are difficult if not impossible to make as the socioeconomic report includes data for only the 100 ranch operators with specific management plans, while the draft statement includes data for operators of both specific and non-specific ranches. For example, Table 3-3 in the socioeconomic report has livestock receipts of $934,916 for all small ranches, while Table 3-14 in the draft report has receipts for these ranches of $1,301,895. Similar data for non-specific ranches cannot be found in the socioeconomic report.

78-35 A review of the draft statement failed to reveal the incidence of investments and maintenance costs for the improvements planned in the proposed action and some of the alternatives. The amounts involved and who pays for them should be stated explicitly in each of the economic statement sections under the proposed action and each alternative. Since each of the proposed improvements are to increase production, the suggestion of ASCS cost-sharing on private lands is especially inappropriate. During the last budget year, and presumably in future years, the federal administration has deleted budget appropriations for cost sharing if the goal is to increase agricultural pro-

Response 78-33

The input-output model used in making calculations is included with the socioeconomic support document, as revised, which is on file at the Roswell District office.

Response 78-34

Table 2-11, page 2-43, has been revised to be consistent with the support document.

Response 78-35

See comment 64-5. The BLM mentioned ASCS programs to show the interrelationship between the two agencies. This interrelationship has been a source of funds in the past and is worthy of inclusion in the document.

78-35 cont. duction. Specifically involved is the Agricultural Conservation Program of the ASCS, the program suggested in the draft statement as the source for cost-sharing funds. The federal administration has also deleted funds to finance operation of the Federal Rangeland Improvement Act of 1978. Now is a particularly inappropriate time for one federal bureau to suggest financing schemes for range improvements when all indications from the federal administration is to avoid financing these improvements.

78-36 The suggestion for diverting cropland in southeastern New Mexico for livestock forage production or grazing is not economically feasible. Forage production and/or grazing uses of these lands are not feasible because of (a) the comparative advantage of other crops, (b) restriction in the use of water for forage crops with high water requirements (such as alfalfa), and (c) the higher energy costs associated with forage production. Feed grains can only partially substitute for range forage. Harvested forage can substitute for range forages only during emergency periods for maintenance rations, or for special production-increasing uses such as feed for herd bulls or breeding and late pregnancy periods. Present costs for full supplementation of range cattle is about $18 per month, or three times the rate for pasturing cattle on privately-owned pastures.

Response 78-36

Use of private pasture or cropland is described as an alternative measure for ranchers in so far as such use could be made at reasonable cost. The discussion is not a suggestion, but an attempt to consider all possible outcomes of the proposed action. The analysis in Chapter 3 suggests that competition for such grazing lands would drive up prices of private leases, and temporarily enrich leasors. Such activity would not necessarily change land use.

78-37 It is not logical that the smaller ranches with the most dependence on federal range and the lowest rates of returns are being proposed for the smallest short-run reductions in grazing permits (two to 14 percent) under the proposed action, while the larger ranches with the least dependency on federal range and the highest rates of returns are being proposed for the largest reductions (33 percent). Does this mean that either (a) privately-owned lands are in poorer condition than federal lands, or (b) federal lands on the larger ranches are in poorer condition than federal lands on the smaller ranches? Explanations are needed for this apparent paradox.

Response 78-37

In order to discuss condition, it is necessary to correlate forage species composition and densities at the present time with the range's potential forage species composition and densities. Comparisons of present production with past stocking rates would only reflect one of two things: 1. a historical permissable stocking level that exceeded the forage production, or 2. a change in forage production levels, i.e., upward or downward trend. To our knowledge, there are no recorded range conditions at the time historical stocking rates were established. Therefore, amounts of reduction would not indicate levels of condition. No attempt has been made to analyze why the reduction in stocking rates are less percentage-wise on small ranches with high dependency on public lands than they are on large ranches with less dependency. This difference may be due to a combination of factors; perhaps there has been less intensive livestock management resulting in a downward trend in condition on larger ranches, or previous stocking rates were set in excess of forage production, or perhaps actual use being made of the range is less than licensed use has indicated on the larger ranches. The smaller ranches may more accurately reflect their actual use with their licensed use, and that being more nearly aligned with what the range is actually producing.

78-38 In a few cases, the overall impacts were reported as a percent change in receipts or returns. However, in several important cases, the changes were reported in dollar values. Some consistency is in order. For example, the impact of specific grazing management "would be a drop of more than $1.5 million in the value of livestock sales from the ranches in the ES area, and a decline of $1.1 million in net returns to ranch operators". A direct comparison cannot be made because present sales and returns of all ranches, including non-specific ranches (those not being subjected to allotment management plans) were not reported separately. However, if the data in Table 2-12 included only specific ranches, the decline would be 18 percent in livestock sales, and a substantial 43 percent in returns. If the non-specific ranches could be excluded, the percentage declines would be even larger.

A table of comparisons for major resource components is needed for the short-run as well as the long-run. as in Table 8-3.

Response 78-38

In the ES, as revised, tables contained in the economics section describe only ranches with allotments which would be placed under "specific grazing management." The definition of tables is consistent between chapters and with the socio-economic support document.

78-39 The acceptability of economic projections based on one year of economic data is more questionable than the acceptability of biological extrapolations based on one year of biological data. Prices received for livestock can and have changed as radically in one year as have, for example, annual precipitation in southern New Mexico. Some qualifications should be made in both the socioeconomic report and the draft statement indicating some limitations in using one year of economic data for the extrapolations, particularly those for livestock energy, and feed prices.

Response 78-39

Graph 3-1, page 3-59, has been added to this section to predict incremental changes of livestock allocation in conjunction with forage production. With increased livestock allocations, ranch jobs and returns to ranchers would increase.

78-40 The Summary in the Draft Statement contains a brief section dealing with short-term economic impacts. A review of this section, the body of the ES, and the economic report by the Harbridge House elicited the following comments:

1. With a reduction of 65,774 AUM's in the short-run, or 5,481 animal units, with a market loss of $1,000 per animal unit as stated in the

Response 78-40

The $8.5 million loss refers to a decrease in rancher wealth-capital position from all grazing. The support document and the ES were revised to show "specific grazing management "areas only because of the lesser degree of grazing supervision being proposed for allotments with "no-specific grazing management." The ES has been changed to reflect the correct income figures. Tables 2-11 and 3-10 present a livestock receipt comparison. Employment data was derived from the New Mexico I-O model as per Larry Adcock and Association. The summary statement has been revised to show the correct figures. The final ES and the summary have been revised and now use the same terminology and units of measure. The loss in rancher wealth-capital position would only occur when the ranch is sold, transferred, or used as collateral. If one of these three actions does not occur, the impact is non-existent.

78-40 cont.

Draft Statement, the loss would be $5,481,000 rather than $8.5 million.

2. Data were not included for average non-specific ranches for the 1978 period separate from average specific ranches. The 1984 changes were for specific ranches only. The summary statement dealing with average ranch income changes per ranch from 1978 to 1984 apparently referred to both specific and non-specific ranches. Accuracy of the 50 percent estimate on average ranch income decline could not be checked. If the change anticipated applied only to specific ranches, the decline is 59 percent rather than 50 percent.

3. No tables were found indicating changes in employment for both operator and hired employees on-ranch, and for both operator employment off-ranch and employment associated with business firms dealing with ranches. Employment changes in the summary statement could not be checked, based on lack of data in the text of the Draft Statement.

4. The summary statement indicated 15 ranch employees would lose their jobs. On page 3-61, the text indicated eight to ten part-time and full-time ranch workers would lose their jobs. Further, the summary statement indicated 50 to 60 ranch operators "would be forced" to seek outside employment. On page 3-61, the text indicated 38 ranchers already hold non-ranch jobs and only 15 ranchers "would be pressed" to seek non-ranch jobs.

5. Several hours were spent in cross-checking per ranch and total ranch statistics from the Harbridge House report with similar data in the Draft Statement. Spot checks revealed that the tabular data were in general agreement. However, two major problems encountered were:

-17-

78-40 cont.

a. There was a general lack of data in the Harbridge House report on non-specific ranches which made validation of draft report statistics on total ranches (specific plus non-specific) almost impossible in many instances.

b. The draft report used different units of measurement and terminology than that used in the Harbridge House report. It is not expected that the general public will be able to comprehend and validate data used in the draft report because of these conversions. In addition, the Summary in the Draft Statement uses different terminology than that used to describe the data in the text of the Draft Statement.

78-41 The proposal that management plans include a provision that requires annual adjustments of livestock numbers to droughty (and presumably non-droughty) conditions ignores the economic and biologic feasibilities of southwestern ranch management. Cow-calf operators, unlike profit independent public experiment stations, have flexibilities of only about plus or minus 30 percent in changing herd numbers (about 14 percent in cow numbers and 16 percent in heifer replacements). Heavier culling or replacements interfere with long-term herd breeding programs. Further, with marginal ranch profitabilities and heavy indebtedness, ranchers are unable to continue in business unless they can maintain a foundation herd during drought and drought-recovery periods by means of supplemental feeding. The only economically feasible alternative for cow-calf operators faced with rigid annual mandates of herd sizes is a change in operations. This change may be either a shift to a cow-calf-yearling herd composition, or the even more radical shift to a yearling operation. An economic incentive toward shifts such as the above should include recognition that 400-700 pound animals consume less forage, about 30 percent less, than

Response 78-41

The suggested annual adjustments are designed to allow flexibility for ranchers during drought and non-drought conditions and may not fluctuate more than the 30 percent suggested by this comment. BLM regulations do provide for recognizing different weights of animals. Therefore, the suggested economic incentives could be provided.

Supplemental feeding during drought periods to avoid sale of animals is an alternative that could be considered. BLM does have the authority to authorize supplemental feeding.

Financing difficulties were considered in the development of Chapters 3 and 8.

78-41 cont. the standard animal unit of a 1,000-pound cow, and grazing permits should be adjusted accordingly. However, the credit requirements for purchase of yearlings and increased variability of cash incomes as calves are retained in good periods and yearlings and calves are liquidated in drought periods create financial problems for lending institutions and ranchers.

Wildlife

The Environmental Statement states that the ES area was historically a grassland of few shrubs. Due to a combination of factors, the area is now heavily infested with mesquite, creosote, and shinnery oak. A management decision has been made by the Bureau to attempt to return the area to grasslands. From a wildlife point of view, this management decision has both negative and positive impacts. Certain types of wildlife are associated with shrublands and different types associated with grasslands. The shrubland species will decrease while grassland species will increase.

78-42 The stated specific objective of the ES is to provide a stable base for the livestock industry. It further states that this objective would provide for the improvement, development, and rehabilitation of the public land for the benefit of livestock grazing over the long-run consistent with environmental and economic constraints and with the concepts of multiple use and sustained yield. Are these statements, as written, in the Purposes and Objectives section actually based on a multiple-use concept or are they written under a single-use objective?

While the proposed action does not maximize wildlife values, it appears to make optimum use of the anticipated available forage. Alternative 6, Enhancement of Other Resource Values, makes maximum use of the forage for wildlife values. However, the cost of implementation of this alternative

Response 78-42

The Purpose and Objectives Section (page 1-2 of this document) reflects those objectives for livestock grazing which were developed, using a multiple-use concept. Objectives for other uses were not included in this: an Environmental Statement which is concerned with livestock grazing. Those wildlife and resource objectives which can be attained through livestock grazing management are also included.

compared to the expected returns for wildlife cannot justify Alternative 6 as a preferred alternative.

The description of the wildlife environment is quite comprehensive and appears to be based on a thorough literature review. A need for many editorial changes is noted. Suggested changes are included in the following section.

The author should be complimented for certain specific proposals in the statement designed to enhance the wildlife resource, for example, the protection of both prairie chicken habitat and riparian habitat. However, approximately 3,500 acres to be included in the prairie chicken exclosures are in
78-43 fair to poor condition. Vegetational manipulation should be considered within these enclosures to increase their effectiveness for prairie chickens. Additionally, all 164 dirt tanks consisting of 82 acres will remain unprotected. These riparian areas on federal lands should be fenced to establish upland aquatic habitat in the ES area where it is currently almost nonexistent. Water lines leading to watering facilities below the tanks would provide water for livestock.

Past studies have shown that wildlife, in general, require a minimum of five percent of the available forage. The ES statement proposes to allocate 2,893 out of 168,000 AUM's to wildlife. This provides only 1.7 percent of the available forage to wildlife. By the year 2000, the ES anticipates 367,442 AUM's for livestock and 3,114 AUM's for wildlife. Forage allocation to wild-
78-44 life will have dropped to .8 percent. Why has the percentage of forage allocated to wildlife been reduced to half by the year 2000?

Under the proposed program, hunting opportunities for quail, doves, rabbits, bobcats, and coyotes will decrease while hunting opportunities are

Response 78-43

As a result of the analysis of the proposed action, some form of brush control may be identified as necessary within the exclosures to reduce the density of brush species. This option is available under the "Livestock Forage Maximization" alternative and would be considered before a final decision is made.

Inclusion of a small part of every dirt tank within two acre exclosures was proposed in the MFP Step 1 portion of the planning system (Page A-4 of the DES). Fencing of small portions of all 164 dirt tanks would improve aquatic habitat and is a consideration under the "Enhancement of other Resource Values" alternative.

Response 78-44

Forage production is expected to exceed the rate of increase in big game populations, (See Graph 1-1, page 1-5), therefore, less forage, percentage wise, would be allocated to big game. Forage allocations were made for existing numbers of big game, potential increases would be provided for through consideration of proper use since it was determined that forage allocations were not a limiting factor in herd expansions, numbers should increase only as other limiting factors are mitigated.

proposed to increase for big game, specifically, antelope. However, based on
the proposed AUM increase alone, from 2,893 currently to 3,114 in the year
2000, only 221 more AUM's will be available. Based on 14.8 antelope per AUM,
the proposed increase would be 272 antelope. Only bucks are currently hunted.
Using BLM estimates of three bucks per ten does, approximately 80 additional
78-45 permits will be available. Does an increase of 80 antelope permits balance a
decrease in deer, coyote, dove, and quail hunting? The amount of recreational
days lost and gained under the proposed action should be addressed and included
in the statement. Additionally, management objectives of the State Game and
Fish Department and of the BLM should be reconciled before the final ES is
produced. As stated in the ES, the Game and Fish Department plan for a harvestable surplus of wildlife, approximately 1,900 deer and 1,000 antelope, in the
ES area. The ES, on the other hand, states that there are currently approximately 1,000 deer and 1,100 antelope in the area. The proposed action is
expected not to increase mule deer populations over 200 animals, 700 less than
Game and Fish estimates. Antelope, on the other hand, are expected to increase
to about 1,400. Already at 1,100, there are more antelope currently than the
1,000 expected by Game and Fish.

The Environmental Statement states that there are currently between 350
and 400 prairie dogs found in the ES area. It further states that their range
is not as extensive due to past control programs, but present towns are not in
serious conflicts with grazing programs. This implies that few prairie dogs
are found in the area. A recent survey within Lea County, however, showed
from the 167 returns that 77 had prairie dogs on a minimum of 12,880 acres of
78-46 state and private lands. Since the ES indirectly effects private and state
lands, it should include this information and emphasize that prairie dogs may
be considered a problem within the ES area.

Response 78-45

The increase of antelope hunting permits will not decrease deer hunting opportunities. An increase of 200 deer can be expected by the year 2000.

The New Mexico Department of Game and Fish predictions for the deer and antelope harvest are based on management unit descriptions and include areas which were not included in this ES. Reductions in hunting opportunities for quail, dove, coyote, bobcats, and rabbits are not anticipated. The text has been changed to reflect this information (See page 3-52). Brush kill rates of 40 percent should not reduce populations of these species.

Response 78-46

Most of the surveyed ranches probably lie outside the Roswell Grazing District where the BLM charges for the amount of forage consumed on isolated tracts and does not actively supervise livestock use. The proposed action would have negligible effects on these areas and, additionally, none of these prairie dog towns are on public land and thus were not described in the ES.

Erosion

78-47 The seldomly-used PSIAC method of determing erosion classes (page 2-12) has remained in obscurity for over a decade, primarily because it does not use valid variables in determining sediment production. An evaluation of each of the variables used in the PSIAC method follows:

Surface Geology - Soils with a high clay and high organic matter content may have a lower sediment yield than an unstable vesicular silty soil. Therefore, texture, when considered singularly, is a poor indicator of erosion. This variable probably has little meaning.

Soils - Most all research indicates that infiltration and erosion are exclusively affected by the top four inches of soil. Why, then, is this variable included in the method?

Climate - This rating is based on the value from a nomograph for a two year, six year, isopluvial storm. How can this value be useful when most storms in New Mexico are not even similar to a two year, six hour, isopluvial storm?

Runoff - This variable is dependent upon the water yield section of the ES being valid. The water yield section is of questionable validity because no runoff measurements were made.

Topography - This section is questionable. There is no place in the ES which shows where any information was collected. How do the authors know that the relationship between erosion and slope is linear?

Cover - This variable is an unreliable indicator of soil erosion when used without standing phytomass. A soil having 60 percent cover of grazed buffalo grass does not have the same erodibility as ungrazed bluestem with 60 percent cover, yet with this method, they receive the same value. The effects of coarse fragments are not full understood. Some researchers feel that the coarse fragments concentrate the overland flow into channels between fragments

Response 78-47

PSIAC procedures are an accepted methodology for estimating sediment yield on ungauged watersheds having little available hydrologic data. Phase I watershed conservation and development data were correlated and field tested with gauged sediment production or PSIAC methodology estimates on 21 watersheds ranging in size from .67 to 698 square miles. These watersheds, for which correlations were developed, are in arid and semi-arid areas of east central Oregon, north central New Mexico, southeast Arizona, northeast Nevada, southern Utah, and southeast Idaho. These areas represent a variety of geologic, climate, ecologic, and topographic conditions. Estimates of sediment yield correlated closely with reservoir, weir, and/or sediment sampler, measurements (when available). Methodology developed by Musgrave and the Universal Soil Loss Equation are also used to predict soil loss. They utilize factors (climate, cover, soil, etc.) similar to those used for the PSIAC method, but are restricted to small areas (40 acres plus or minus) and the use of models. To project these models over large extensive areas would introduce a great element of error. Therefore, the PSIAC method of estimating sediment production is the only available method for estimating total sediment production on large areas for both present and future conditions.

Sediment yield studies which used the PSIAC method in New Mexico are in the San Juan area near Farmington and the southern Rio Grande area near Las Cruces. These studies correlated PSIAC to gauged reservoir readings to estimate yield.

The State of New Mexico Soil and Water Conservation Division's areawide (208) water quality planning has used the PSIAC method throughout the state. U.S.G.S. has approved the use of PSIAC methodology and uses it within the state (U.S. Geological Survey professional paper 700-D, pages 0245-0249-1970). A study in Colorado (Colorado Water Circular No. 30, 1975) utilized these methods identify sediment yields before and after in oil shale development.

78-47 cont. which accelerates gully erosion. Others feel that the energy from concentration is more than compensated for by the energy dissipation from raindrop impact.

Land Use - How do the authors know that the relationship between utilization and erosion is linear? Were these measurements made for this ES?

Upland Erosion - The soil surface factor (SSF) methodology was never designed for use in estimating erosion quantitatively nor does it work well for that purpose. How can one justify using it here?

Channel Erosion and Sediment Transport - The values for this section are so subjective they are nearly meaningless.

How was the table on page B-2 derived? How were PSIAC and sediment production values assigned to each other? The only way that this relationship between PSIAC and sediment yield could be valid is with many on-site measurements under all conditions and combinations listed from A through I. Why were these measurements not taken? Unfortunately, this method of determining soil loss, as it is used here, is of no use in making explicit land management decisions. Therefore, this ES does not really address the impacts on erosion.

Surface Water Production

78-48 The ES implies that there essentially is no surface runoff from the area, because 95 percent of the area is in a closed basin and this closed basin does not display evidence of periodic stream flow (page 2-15). However, Visual A shows many intermittent streams within the closed basins which must flow periodically. Why were surface water production data not collected for these intermittent streams? Even though these streams are in a closed basin, they have erosion potential, especially from high intensity, low frequency summer thunderstorms. Why are many intermittent streams on Visual A documented on state and private lands to the west and east of BLM lands, but few intermittent streams are shown within the BLM's closed basins.

Response 78-48

Surface water production data was not collected from intermittent streams in the ES area because run-off did not occur during the study. (Hydrologic Data, East Roswell ES Area, Geohydrology Associates, 1978). Erosion potential for these streams is minimal because the sandy soils and generally slight slopes result in rapid water infiltration and reduced run-off potential. The majority of the intermittent streams are found only on the east and west side of the ES area. This is a geological characteristic of the area.

Surface Water Quality

78-49 How does the BLM know that the one water quality sample which was taken from one pond on the extreme western edge of the ES area was "typical of surface water runoff for the area"? It probably was not typical, and water quality for the ES area was essentially not evaluated.

Summary of page-by-page comments:

78-50 Page 1-2, Par. 3. Is it feasible to strive for potential forage production on each range site? Potential for what species of animal is the objective? Potential vegetative production may not be obtainable and still have any viable livestock use.

78-51 Page 1-4, Par. 1. ... less than one half of the ES area's total vegetative production. Does this mean that less than one half of the total production is usable or that only one half of the total production was measured?

78-52 Page 1-7, Par. 1. Would not a reason for unsuccessful AMP's have been faulty planning of the grazing system?

78-53 Page 1-13. Picloram as a liquid has not been labeled for use on rangeland (i.e. Tordon K or Tordon 22K) in New Mexico. It is only available as a formulation with 2,4,5-T (i.e. Tordon 22E). Dicamba and Picloram are manufactured by two separate chemical companies which may create difficulties in labeling these products as a tank-mix.

78-54 Page 1-18. Policies and laws to be followed in the proposed brush control program appear to be repetitious in regard to the ES.

The herbicide 2,4,5-T is a federally registered pesticide and should be reconsidered for possible use. Work done by Leifeste and noted in the ES as effective for mesquite control provide strong evidence for this herbicide.

78-55 Page 1-23. Is there research data to show a need for a 16 month's rest following chemical treatment for vegetative recovery or is this a label requirement?

Response 78-49

Consultation was made with Geohydrology Associates, Inc., who made this study, and their response is as follows:

We believe that the sample collected in the artificial empoundment in Long Arroyo is representative of the chemical quality of surface-water run-off from the Eastside Roswell area. During the period of the study, precipitation rates were below normal. Also, due to the "flashy" nature of the arroyos in the area, it was not possible to collect a sample during a rainfall event. Long Arroyo is the longest drainage system west of Mescalero Ridge, and the arroyo crosses all of the geologic formations that are drained by the Pecos River in that area. Thus any effect of the geologic formations on surface-water quality would be reflected in the sample from Long Arroyo.

It should be recognized that the sample was intended to determine the chemical quality of surface water. Obviously the sediment content would be much higher in a flowing stream than in the artificial empoundment where the sediment would be deposited. However the purpose of the sample was to determine chemical quality, not sediment load.

We took the liberty of contacting Messrs. G. Edward Welder and C. Clare Cranston concerning this problem. Both are employed by the Water Resources Division of the U. S. Geological Survey. Welder is a Hydrologist who has conducted studies in Chaves County for about 10 years. Cranston was Supervisory Hydrologic Technician for southeastern New Mexico for many years.

Both men concur that, with the exception of our sample collected in Long Arroyo, none of the arroyos in the Eastside Roswell area have even been sampled. This is due to the "flashy" nature of the arroyos, limited rainfall, and poor access to the area. Both men agreed that the only logical method of collecting a surface-water sample was the technique which we used in sampling a natural or artifical empoundment. They point out that chemical analyses are available from several spring-fed Pecos tributaries, however these are more representative of ground-water quality than of surface-water quality.

Response 78-50

The BLM feels that it is feasible to strive for the potential forage production levels on each range site. The potential forage production would be for all herbivores present and those which are predicted to be present as discussed in Chapter 1.

This ES discusses the forage production, which is just a portion of the total vegetative production. Through implementation of the proposed action an increase in forage production is expected, a portion of which may be used by livestock. BLM does not propose to improve everything in the ES area to the point that it would reach a climax vegetation stage, but only to that productivity level.

Response 78-51

The statement made on page 1-4 paragraph 1, means that the properly usable vegetative production represents less than one half of the total vegetation production. This is because PUF's for most forage plants are less than 50 percent and also some non-forage plants were not measured. The non-forage plants include javalina bush, and cactus.

Response 78-52

See Response No. 13-1

78-56 Page 1-31, Par. 3. How soon would the monitoring system be put into effect?

78-57 Page 1-32, Par. 5. It could not be determined from the proposed action where SCS would initiate the specific grazing plan.

78-58 Page 2-3, Par. 2. Why was total production not measured in this inventory? What was not measured?

78-59 Par. 4. If data were not taken estimating current cover, then how can prediction of 20% improvement in cover (3-21) be projected?

78-60 Page 3-15, Par. 4. "Twenty-three of these allotments (20 percent) ..." Shouldn't this be 31 percent (23/74)?

78-61 Page 3-19. Text shows 21,000 acres (sand dunes and barren areas) would not improve and the table shows 29,000 acres in poor condition. Which number is correct? Are sand dunes waste and barren areas range sites? Do they have a potential climax? Are they in poor condition now and will they remain in poor condition in the future. It seems that to more accurately portray range condition, these areas should not be shown in poor range condition, if they are doing as good as can be expected.

78-62 Page 3-21. "... 20 percent increase in ground cover ..." Is this basal or aerial cover?

78-63 Page 3-55. "... grazing systems requiring more than one year's rest would also require an additional 25 percent reduction in livestock numbers ...." Was this additional 25 percent reduction analyzed for economic impacts? This combination with the average 28 to 40 percent reduction may be more than any permittee can withstand.

78-64 Page 8-1. The proposed action seems to be presented as a justification for only brush control, and other alternatives are given very little consideration. The opportunity should be given for a rancher's alternative for manage-

Response 78-53

See Response No. 78-6. As stated on page 1-26, 2,4,5-T and Silvex are no longer authorized for use by BLM and can, therefore, not be considered. On page 1-14, it is stated that 2,4,5-T is presently on the list of chemicals prohibited for use by the Department of the Interior.

Response 78-54

See Response Nos. 78-6 and 78-53.

Response 78-55

Bureau policy is to rest pastures for two consecutive growing season's after vegetative treatment. The minimum time requirement for this is 16 months.

Response 78-56

Study plots are already being located and transects run; this effort will be expanded until all ranches are monitored.

Response 78-57

The SCS could assist, at the rancher's request, in developing grazing plans on the 74 "no specific grazing allotments." The BLM would initiate "specific grazing systems" on the 90 proposed "specific grazing systems" and the 20 existing "specific grazing systems." The BLM and SCS could work jointly on these systems as long as BLM objectives were met.

Response 78-58

Total production of all vegetation was not measured during this inventory because the purpose of the survey was to determine the forage production available to and usable by herbivores. Measurements of the total biomass production were not necessary. Vegetation which was not measured includes various cactus species, unpalatable portions of thorny shrubs and leaf blades of yucca. Shinnery leaves and acorns were sampled, as were mesquite leaves and beans and yucca stalks.

Response 78-59

Page 3-15 under the heading "Cover" and Appendix 3, Table C-2, discusses ground cover. Data was taken to estimate current cover.

Response 78-60

Reference made to the percentage of allotments involved has been deleted.

Response 78-61

The text on page 3-19 has been revised to reflect the correct numbers.

Response 78-62

The terms "cover" and "ground cover" as used in this document are defined in the Glossary on pages G-5 and G-8 respectively. In this case, it is both basal and aerial cover on shrubs as well as litter accumulation.

78-64 cont. ment. With objectives that were agreed upon by both BLM and the users, a very workable solution to management could emerge. For example, if goals and objectives were agreed upon with specific time periods for completion, the rancher would be allowed to strive for these goals in the best way possible within his management capabilities and BLM regulations. The rancher's progress would be monitored and upon demonstration of his failure or noncommitment to attain the goals, then BLM management would be imposed.

78-65 The proposed action includes information on allotment specific grazing management plans. Are these the same as Allotment Management Plans as authorized under the Federal Land Policy and Management Act of 1976? The development of these allotment specific management plans will need to be re-evaluated under the amendment in the Public Rangelands Improvement Act of 1978, as the methods under which AMP's are to be developed have been revised and need to be considered in the revision of the final draft. According to the law, AMP's are discretionary and, if developed, must be done "in careful and considered consultation, cooperation, and coordination with the lessees, permittees, and land owners involved, the District Grazing Advisory Boards established pursuant to Section 403 of the Federal Land Management and Policy Act, and any state or states having lands within the area to be covered by such Allotment Management Plans." Because the BLM has assumed the responsibility for private and state lands by assigning carrying capacity for these lands, without the cooperation of all involved, it is unlikely that the proposed AMP's will succeed.

78-66 Page C-3. In reviewing Table C-3 in the Appendix, it seems that allotments under BLM management are not being maintained as well as allotments under rancher management, in terms of livestock reductions. Of the 20 ranches under AMP's, only two are receiving an increase in AUM's and the other 18, or 90 percent, are receiving reductions. Of the ranches not presently under

Response 78-63

See Response No. 78-8. This additional reduction was considered in making the socioeconomic analysis.

Response 78-64

Based on review of research and on observations made within the Roswell District by range specialists, brush-invaded rangelands are not expected to increase appreciably through any type of grazing management by itself. However management, (a rancher's alternatives, cooperative alternatives, or BLM alternatives) has great potential for improving these rangelands with brush control treatments. Methods of determining grazing management are not outside the scope of this recommendation and are commendable. The alternative chosen by a rancher would need to be documented to indicate commitment and to aid both BLM and the rancher involved in monitoring progress. Certain aspects of the management alternative chosen would need to be agreed upon to insure that consideration for other uses has been made. This should not be difficult.

Response 78-65

See Response Nos. 14-2 and 74-1.

Response 78-66

See Response No. 13-2.

78-66 cont. AMP's. 84 percent are receiving reductions and 16 percent will be receiving increases in AUM's. These facts alone would indicate that the existing AMP's are not evidence of improved management over the permittees' management.

78-67 Page 2-5. Of the total lands with a good condition rating, 68 percent are in the non-AMP area. Only 25 percent of the lands under AMP management are in good condition. An apparent upward trend is also noted on 84 percent of the lands not under AMP's as compared to 30 percent under AMP management. Overall trend for the ES area shows that apparent trend is up on 61 percent of the total lands and 36 percent being static. As these data were obtained during a dry year, it would lead one to believe that overall management has not been that poor.

Response 78-67

See Response Nos. 7-1 and 13-2.

78-68 Page 8-27. If no labels for the chemical herbicides are approved, then alternative 6 becomes a very realistic alternative. However, this alternative has not had much thought put into it from a practical standpoint; i.e. "No new specific grazing systems would be developed, no additional livestock facilities or vegetative treatments would be permitted." Is this statement saying "if brush control is not allowed, then no improvements will be allowed"? Wouldn't the proposed water developments be beneficial for livestock distribution and wildlife use? What about Section 4 permits to provide for improvement projects? What percentage of the existing improvements were developed under Section 4 permits? This alternative seems to discourage any incentive for range improvements or management.

Response 78-68

Alternative 2 does not provide for use of herbicides but does provide for water developments. The method of permitting range improvement projects would be administrative in nature and Section 4 permits are still a method of permitting range improvements. The specific percentages of projects which have been developed under Section 4 permits have not been determined. However, they would make up a relatively high proportion of the projects. BLM policy requires that proper grazing management programs be developed before large investments can be made in a range improvement program.

Page 9-1. Has BLM begun to hire livestock specialists?

Page 9-3. Ron Soysebee should be Ron Sosebee.

78-69 Page A-1, Par. 4. Allowances were made for utilization and stages of growth, but was allowance made for rainfall conditions? This is a very critical component when using vegetative production to calculate carrying capacity.

Response 78-69

See Response No. 7-1.

78-70 Page A-2, Par. 2. Were variable proper use factors developed for the various range sites or types as proper use on a particular species varies with its associated species (palatability rating).

78-71 Page A-4, Par. 1. PUF for the most palatable species was set at 55 percent "... and these species make up less than 20 percent of an allotment's forage production ..." Does this mean that forage utilization of 55 percent of only 20 percent of the forage species would be acceptable?

78-72 Page A-14, Range Suitability for Livestock Grazing. "... soil surface factor ..." The SSF has too many subjective measures to be a valid rating of soil conditions.

78-73 Page 3-7. In reference to Table 3-1, poor and fair condition black grama/bush muhly range types with no brush infestation are shown as responding favorably in range condition trend only after receiving a minimum of 16 months of rest. Good condition ranges of this type are indicated as having a gradual decline in range condition until or after 16 months of rest are applied to the area.

This example appears to be only a justification for preconceived ideas of rest-rotation grazing systems. Were other proven grazing systems employing shorter rest periods and lower stocking densities (e.g. Merril deferred-rotation grazing system) ignored in order to implement rest-rotation practices?

Page 3-60. In light of the proposed allotment reductions, the BLM has suggested means for individuals to remain in the livestock ranching business. 78-74 The second suggestion was that ranchers utilize private or state land to graze animals no longer permitted on BLM lands, "thereby maintaining herd sizes at profitable levels". If BLM lands are in need of livestock reductions, then is the Bureau advocating over-use of state and private lands? This suggested method of more heavily utilizing state and private lands to compensate for

Response 78-70

Variable proper use factors were not developed for the various range sites for two reasons: 1. because the extensive nature of this type of survey, and 2. because several range sites occur within most pastures. The range site having the highest production potential usually is the one receiving the greatest concentration of livestock and the greatest degree of use, therefore the set PUF would still be valid.

Response 78-71

On most range sites, the species having a PUF factor of 55 percent would be the decreasing species and their physiciological requirements must be met or they will be reduced in the plant composition, resulting in a lower condition class and a downward trend. However, if they make up 20 percent of the composition, the probability is that the other associated forage species would be fairly high in usage, also resulting in a proper "total" range use being at the moderate rate (40-60 percent).

Response 78-72

The SSF is not a rating of soil condition but is rather a relative ranking of those erosion conditions existing on an area. Areas which reflect a high rating exhibit some type of problem in regards to erosion, whereas areas with low ratings indicate little erosion problems. Using this relative ranking, it can be used to identify areas which have erosion problems and should not be subjected to activities that would cause further disturbance.

Response 78-73

Table 3-1 is not a justification for any grazing system. It is a table designed to show probable vegetative responses to different treatments. This ES does not advocate any one grazing system. It analyses the impacts of most grazing systems. (Also, see Response 78-13).

Response 78-74

The BLM does not advocate over-use of private or state lands, nor does it mandate management on these lands. They may be, however, directly impacted due to the intermingled nature of land patterns in southeastern New Mexico. (Also, see Response 74-1). The assumption was intended to mean that private and state lands would not deviate in the overall type of use.

permitted livestock number reductions does not agree with specific assumption number 2 given at the beginning of chapter 3 (3-1). This assumption stated that current uses of private lands in the ES area would remain essentially the same after implementation of the proposed action.

78-75 Page 1-27. A smooth bottom strand instead of barbed wire would promote ease in antelope movement.

78-76 Page 2-3. Designation of this entire area as shortgrass prairies seems a great oversimplification. There is quite a bit of sandy land that supports taller grasses, e.g., the bluestems mentioned in the species list on page 2-2.

The description of original landscape and vegetation at the top of page 2-3 seems oversimplified. Much BLM land (e.g., Mescalero Sands, area along southern part of Eddy-Lea County lines) is sandy, not so flat, and supports taller grasses.

The statement on page 2-6 that "The dropseed-bluestem grasslands would dominate the majority of the ES area ..." seems accurate. Yet, the previous general descriptions (pages 2-2 and 2-3) seem to stress flat country and shortgrasses, which is entirely different.

78-77 Page 2-16. The statement which says that these closed basin ponds can store 104,422 acre-feet of runoff seems to imply that more runoff is expected on BLM lands in the closed basins than what was indicated.

78-78 Page 2-18. Some citations, e.g., "BLM (1978)" are not listed in References. Additionally, it is not quite accurate to state "... only well-managed grasslands are used." It would be very accurate to say that only relatively high quality tall grass areas provide enough nesting success to ensure perpetuation of prairie chickens on BLM lands in New Mexico. The third paragraph should be completely rewritten after reviewing the final report on the prairie chicken study.

Response 78-75

The text has been edited to reflect that a smooth bottom wire would be used on the 3-strand fences. (See page 1-27.)

Response 78-76

See Response Nos. 62-4 and 62-5.

Response 78-77

Most of these playas and stock ponds which provide the 104,422 acre-feet of storage capacity are located on private and state lands. The drainage or run-off area to these playas or stock ponds is generally less than .25 square miles in area. Storage capacity does not reflect that more run-off can occur, only that more storage capacity would be available, should more run-off occur.

Response 78-78

See Response No. 62-6.

78-79 Page 2-19. "Major Habitat Types and Related Animal Species" is included in "Listings", not in Appendix 2. Beaver and muskrat should be included as furbearers in Appendix 2.

78-80 Page 2-20. Beaver and muskrat should be included with raccoons and long-tailed weasels as furbearers on the Pecos River.

78-81 Page 2-21. The number "997" appears to be an actual count and not an estimate. Perhaps "approximately 1,000 mule deer" would be a better choice. The same applies to "approximately 1,100 antelope."

78-82 Page 3-15, 17. The idea of placing these exclosures where quality grassland now exists is in direct conflict with the ideas of improving and maintaining the overall range. It implies clearly that heavier grazing is planned on the remnant few square miles of quality bluestem now existing. A much more sound approach would be to protect all the existing and bluestem areas from deterioration by careful control of grazing. There is little enough sand bluestem already.

The exclosures should be placed in areas where the sand bluestem has experienced some reduction, although admittedly not where shinnery has taken over completely. The paragraph that discusses how relief from heavy grazing will not help grass recovery is beside the point in areas where shinnery infestation is not yet extreme. In many areas, where considerable ground is not yet taken by shinnery, bluestems will spread under protection. Even if bluestems cannot displace shinnery, they can produce tremendously more growth where ungrazed, and the shinnery areas are where this is needed.

It really is very inadequate to plan for only the amount of quality bluestem (especially sand bluestem) cover that can be supported in a few scattered exclosures.

Response 78-79

Page 2-20 has been corrected and Appendix 2 has been changed to include these species.

Response 78-80

Page 2-20 has been changed to include these species.

Response 78-81

Since forage allocations were made by allotment, the totals for deer and antelope when all allotments are added equals 997 and 1,100. It seemed more important that the totals of deer and antelope from allotments be added up correctly than to state an approximation.

Response 78-82

See Response No. 62-8.

78-83 Page 3-35. Are there actually "111 mule deer" using these scattered pastures or is this an approximation?

78-84 Page 3-36. Table A-20 could not be found. Including numbers of the tables in the text would assist the reader.

78-85 Page R-4. The last bibliographical entry under C. A. Davis was not written by C. A. Davis, according to C. A. Davis.

Response 78-83

These 111 mule deer represents the proportion of deer occuring on public land using NMDG & F density figures of one deer per section and .75 deer per section. The sum total of deer in individual allotments, 4, 10, 8 etc. added up to 111. We kept "exact" numbers since there was no arbitrary way to round off animals without treating some allotments unfairly.

Response 78-84

The reference has been dropped because there is no Table A-20. Page numbers for tables are listed in the Table of Contents, pages vii through ix.

Response 78-85

See Response No. 62-1.

LITERATURE CITED

Gadzia, K. L. 1979. Growth and development patterns of black grama *(Bouteloua Eriopoda)* in Southern New Mexico. M.S. Thesis. New Mexico State Univ., Las Cruces. 92 pp.

Merrill, L. B. 1954. A variation of deferred rotation grazing for use under Southwest range conditions. J. Range Manage. 7:152-154.

COOPERATIVE EXTENSION SERVICE

NEW MEXICO STATE UNIVERSITY
BOX 3AE, LAS CRUCES, NEW MEXICO 88003
COLLEGE OF AGRICULTURE AND HOME ECONOMICS

153
ADDENDUM TO LETTER NO. 78

August 10, 1979

Mr. Jack Naylor
BLM Roswell District
P. O. Box 1397
Roswell, NM 88201

Dear Mr. Naylor:

This letter is to formerly request a necessary change in the wildlife section of the East Roswell Grazing Environmental Statement submitted by the Range Improvement Task Force. It has been brought to my attention that, due to the type of soil within the ES area, dirt tanks may leak if cattle trampling is not permitted. My original statement was based on experience with other soil types.

A compromise which could provide needed riparian habitat without loosing the effectiveness of the dirt tank would be to fence the upper half of each tank. Please amend my statement to reflect this change in the following way:

Delete	-	"all 164 dirt tanks consisting of 82 acres will remain unprotected. These riparian areas ..."
Insert	-	"much of the riparian habitat within the 164 dirt tanks will remain unprotected. The upper half of these riparian areas ..."

Thank you for your assistance.

Sincerely,

Phillip J. Zwank

Phillip J. Zwank
Extension Wildlife Specialist

PJZ:dra

cc: Dr. I. W. Skelton, State Program Leader/Ag
Dr. Jerry G. Schickedanz, RITF Coordinator

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United States Department of the Interior

HERITAGE CONSERVATION AND RECREATION SERVICE
WASHINGTON, D.C. 20240

80

IN REPLY REFER TO:

DES-79/30

JUL 26 1979

Memorandum

To: District Manager, Roswell District, Bureau of Land Management, Roswell, New Mexico

Thru: Public Affairs Specialist

From: Director, Heritage Conservation and Recreation Service

Subject: Draft Environmental Statement for Grazing Management in the East Roswell Area, Chaves, Eddy, and Lea Counties, New Mexico

We have reviewed the subject statement and have the following comments.

80-1 The final statement should include a discussion of the project's effects on Mescalero Escarpment and Mescalero Sands. These sites have been recognized as having National Natural Landmark significance.

The draft statement adequately discusses impacts on cultural resources. However, there are a few points which could be expanded in the final statement.

80-2 The discussion of cultural resources (page 2-28) should include livestock trampling as a source of site deterioration. In addition, this section should be updated to include the most recent determinations of eligibility.

80-3 The discussion on page 2-27 should include more information on the types of sites present and their susceptibility to impacts.

80-4 The final statement should discuss whether any archeological sites or districts are to be considered as Areas of Critical Environmental Concern.

Harold Green
For Chris Therral Delaporte

Response 80-1

Through consultation with the Heritage Conservation and Recreation Service's Natural Landmark Program in Denver on August 2, 1979, BLM discovered that both the Mescalero Escarpment and the Mescalero Sands area are in the process of being proposed as potential landmarks, while the file on the Mescalero Escarpment was being held for additional information.

That portion of the Mescalero Escarpment that is within the ES area is on private land so that it would not be affected. The majority of the part of the Mescalero Sands being considered as a potential landmark has been excluded from grazing.

Response 80-2

Livestock trampling has been added as a source of site deterioration. This section has also been updated to include the most recent determination of eligibility. (See pages 2-27 through 2-29.)

Response 80-3

Additional site information has been added to the text. (See pages 2-27 through 2-29.)

Response 80-4

Areas of critical environmental concern have been covered under Standard Operating Procedure #16 in Chapter 1.

July 28, 1979 82

Tom Kiddoo
Public Affairs Specialist
Roswell District, BLM
P. O. Box 1397
Roswell N. M. 88201

Dear Mr. Kiddoo,

The East Roswell Draft Environmental Statement is a large, poorly organized statement which demands much more studying than can be done in the time allowed. I have read the statement but, in conversation with the BLM personnel at the public hearing in Carlsbad on the D.E.S. I could not find one BLM employee who could say they had read the entire statement. Therefore I believe the people directly affected by the proposals should be given additional time, at least 6 months, to obtain professional counsel. In addition the BLM did not hold public meetings to try to explain or clarify the D.E.S. It almost seems that the BLM does not want the ranchers, quail hunters and other groups to really understand what is involved in the proposals.

82-1 the D.E.S. does not properly address the true cost of any of the proposals. It does not mention the total cost to the government to perform the study, much less to perform the prescribed proposals. It does not properly address the cost to the local communities, counties, or state government. It leaves much left unsaid in discussing the costs to other businesses in the ranchers trade areas. The cost to the rancher is totally unbearable!. A man in his 50's or 60's does not show much enthusiasm, when he is told he can resume his life's work if he takes an outside job for twenty years. Many of these men are incapable of ranching and holding an outside job at the same time, because of their

Response 82-1

The studies upon which the ES analysis was based were not the results of the proposed action and, therefore, were not included in the statement. Also, see Response 64-5.

age, health, location, amount of work in ranching, and the limited number of hours in each day.

The rancher cannot sell his property at this time without taking a severe loss, because the turmoil caused by the government has depressed the price of ranches in a time of extreme inflation, an inflation caused by federal rules, regulations, paper work, and great spending with even greater debt. This period of inflation is a terrific strain on the rancher, as well as others, and if the grazing permits are cut as proposed, the economic effects as stated on the rancher will be greater than projected in the D.E S. and the effects as stated are shocking!

82-2 If a range study is to be valid it must be undertaken in an average year. Stocking rates can be estimated by the methods used if the study is performed according to design. There is evidence from the ranchers that the young people in the field during the study were careless with the methods and locations many times during the study. At any rate the range study is not valid because, it was undertaken during a severe drought. This drought was recognized by the U.S. Government at the time the study was in progress, and the A.S.C.S. offices were making disaster payments during the time of the study. This type of range survey is not capable of determining trend, which should be the primary consideration when setting stocking rates. All the range survey accomplished was to questionably estimate the amount of forage available, during a recognized drought.

Response 82-2

See Response No. 7-1

Additionally, the range surveys were reportedly made without prior notification of the ranchers, hunters, environmentalists or other groups as to the specific dates or locations. As a result, there were few if any onlookers, and a definite possibility that a portion of the survey was made in the shade of a tree. When the figures for the percentage of forage utilization were determined, they were an average for the types of land involved. Specific areas within the types of land involved can be very different, and as a result the utilization factors can be totally wrong.

82-3 The survey was made by the occular estimation method with a clipped sample tken every 6,000 feet. If a surveyor was consistantly wrong, the results were consistantly wrong, because there was never a correction factor applied to anyones estimates at any time, regardless of the estimation error on the weighed samples.

82-4 The present total livestock permitted to graze is 23,480 head. The proposed initial reduction is 9,471 head. The proposed increase is only 7,135 head, which is too small an increase, when the economic and social sacrifices are considered. The D.E.S. states that a 28% reduction in livestock numbers is proposed, but it fails to mention that a 17% reduction in numbers was voluntarily undertaken by the ranchers to protect the range during the drought. As a result the 28% proposal is not an accurate figure, but an understatement.

Response 82-3

The survey was, in fact, a weight estimation method with a clipped sample on each transect. The purpose of the clipped sample was to help the examiner to maintain an accuracy within allowable limits. Should a clipped sample and the estimate made prior to clippling not be within the acceptable limits a second plot was estimated and clipped and so on, until accurate estimates on that transect were being made.

Response 82-4

There would be a 28 percent reduction in livestock numbers from licensed use and a 40 percent reduction from preference. This is a 12 percent voluntary cut from preference. Table A-3 on page A-39 shows changes in both licensed use and preference. The three-year average licensed use reflects what the number of livestock has been. The mention of further adjustments is discussed on page 1-31, these adjustments would be based on utilization studies and actual use numbers. Ten-year average licensed use is even less than the 3-year average licensed use. Therefore, reduction because of drought has not been indicated.

82-5 The D.E.S. proposes to place in effect an Allotment Management Plan on each allotment in the area. The statement suggests larger cuts on the ranchers that currently have A.M.P.'s than it proposes for the ranchers that are independently managed. This is an idictment of the ability of the B.L.M., to intensively manage range resources for achieving increased forage production, and/or range improvement. The periods of rest suggested are, 4, 8, 16, 20, and 24 months for the lands in the A.M.P.'s. The periods are impossible to achieve on this type of range land, and retain economically viable ranches at the same time. Also the proposal to fence out numerous dirt tanks, lakes, trees, and draws will be detrimental to the livestock, while it will benefit wildlife species which were mever numerous in the area.

82-6 Considering the record of the B.L.M. on the A.M.P.'s in effect, versus the average record of the independent operators in the study area, this D.E.S. cannot be complete without a study of the effects of a budget and a personnel cut within the B.L.M., so it would cease to directly manage any individual allotment, and would revert to the status of an overseer to protect the lands from the flagrant abuse, from the small minority that would abuse their privileges.

The D.E.S. states that the proposed brush control and other measures would maximize antelope and lesser prairie chicken habitiat at the expense of the quail population. There is some interest in hunting these animals, but presently there are a great number of people who hunt quail extensively. I am not a

Response 82-5

See Response No. 13-2.

Response 82-6

Comparisons of average licensed use with survey results on the areas with AMPs versus the areas proposed to have "specific grazing systems" developed reflect that an average reduction of 16 percent would be necessary on the AMP areas as opposed to a 32 percent reduction on the areas proposed to have specific grazing systems developed. Although the degree of improvement cannot be discerned from these figures, the level of stocking is apparently more in line with production. Condition, as it is used in this document, does not refer to ecological health, but rather to the quality of a range area for livestock grazing. On the existing AMPs there are no areas in an apparent downward trend, however, there is 4 percent of the area where "specific grazing systems" are proposed that is in a downward trend. Indications are that only through range improvements projects would there be any significant change in ecological range condition and although trend may be upward its rate may be very slow. A reduction in both the BLM budget and personnel would result in fewer acres of range improvement occuring through programs that control brush and less ability to verify flagrant abuse, where it occurs.

hunter, but I believe the quail should be allowed to thrive because of the number of people who consider them to be the primary game species in the area.

The D.E.S. expresses some concern about people "pot hunting" and the subsequent loss of artifacts. This problem was magnified when the B.L.M. identified and mapped areas where remains existed.

The D.E.S. discusses some suggested range improvements, but does not give enough information about these improvements to determine their value if any to the range livestock or wildlife. In the past the range improvement funds were spent only on allotments with Allotment Management Plans. This is prejudicial against the highly motivated independent operators who are more efficient managers than the B.L.M., which this study has shown to be ineffective.

82-7 The B.L.M. proposes to manage private and state lands within the allotments, which is not in compliance with the Constitution, the State Enabling Act, or the Rangeland Improvement Act of 1978.

82-8 This Draft Environmental Statement is unique in the fact that there was no mention of the cost versus value of the major proposals. I believe this aspect was deliberatly overlooked by the writers because, of the absurd costs that even a novice can see. This matter should be examined very closely by a professional engineer and others trained in this field. I could not read anywhere in the statement where this was even considered.

In conclusion, I must state that I am not directly affected (as near as I can tell, at this time), by the D.E.S. The reasons

Response 82-7

See Response No. 74-1.

Response 82-8

See Response Nos. 64-5 and 82-1.

the ranchers are discussed more than other groups are many. One of the reasons is the ranchers are small minority, with a large significance in our society. I don't hunt birds, antelope or relics, but I do eat beef. How about you? There are no environmentalists, or bureaucrats with their livelihoods at stake, but there are many ranchers. Wildlife people "protect" antelope, but ranchers provide water, and salt at all times, and feed during drought. Bureaucrats draw a set salary, while they seem to be trying to minimize the ranchers meager earnings recieved from large investments. In short the B.L.M. seems to be trying to create an overwhelming bureaucracy.

The ranchers are the only group affected by this proposal that have a direct economic interest in the forage and soil. Many of them hope to pass their ranches form generation to generation and would be foolish to practice poor range management.

The majority of the ranchers regard themselves as custodians of the soil and forage. Some of the others do also, but they have not spent thousands of dollars and many hours of work for range improvements.

In short, this is an inadequate study during and official drought that means economic disaster for a small group of good people (see p. 2-37 of the D.E.S.) If allowed to stand and be repeated in other areas it portends disaster for the food budgets of Americans everywhere.

Sincerely,

Alvin G. Kincaid

Alvin G. Kincaid

tk

83

Mr. James H. O'Connor
District Director
Bureau of Land Management
P.O. Box 1397
Roswell, NM 88201

Dear Mr. O'Connor:

This is a formal protest of the proposed Cuts in The East Roswell District. These cuts are extremely drastic. In my case a 65% cut on The Slash X Ranch which I have an interest which has a 1000 hd permit currently and a 70% reduction on The Tom Bingham ranch which I recently purchased.

I am just getting started in ranching and am 29 years old. If these cuts go through they will put me out of business and will never be able to pay out for The rest of my life, let alone get another start in ranching.

83-1 These proposed cuts are based on a survey made on an extremely dry year with a follow up spot check made on a second dry year. In my opinion a survey made on a dry years cannot be considered a representative sample which to base cuts, which will effect everyone for the next 20 years and does not justify these cuts.

I do appreciate The ultimate goal of improving the range conditions, but feel that this can be strived for jointly by Ranchers and BLM without

Response 83-1

See Response No. 7-1

putting everyone out of the ranching business.

Sincerely,
Malcom McCarty

P.S. Matt Irwin & J T McAdams, my pardners in The Slash X Ranch have ask me to include Them in this final protest.

DAVID J. SORENSON
OIL AND GAS

TELEPHONE 505
OFFICE 622-6311
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P. O. BOX 1453
410 SECURITY NATIONAL BANK BUILDING
ROSWELL, NEW MEXICO
88201

85

July 27, 1979

Mr. Tom Kiddoo
Public Affairs Specialist
Roswell District, BLM
P. O. Box 1397
Roswell, New Mexico, 88201

Re: Allotment 5058 and the East Roswell
Grazing Management DES.

Dear Sir:

In February of 1979 I purchased the patented land included in the captioned allotment. In April of 1979 I was called to the Roswell BLM office and told that the allotment had been overgrazed and that the carrying capacity would be cut from 80 head to 41 head - a reduction of 48.75%. I strongly disagree with the BLM's evaluation of this allotment and believe that an accurate, efficient and scientific analysis of presently available forage would result in an increase rather than a decrease in carrying capacity.

Some of the illegalities of the DES were outlined by Senator Domenici at the July 17, 1979, meeting in Roswell, and some of the fallacies and inefficiencies of the methods of preparation of the DES were discussed by representatives of New Mexico State University at the Roswell meeting and by Mr. David Sharbutt, professional engineer, at the Carlsbad meeting on July 18, 1979. I also agree with the comments of Mr. Bud Eppers at both meetings. Consequently, I will not repeat any of their allegations.

85-1 Although I have not had the time to review in detail the subject DES, I have read enough to realize that it is so inaccurate on matters of fact that the validity of its forecasts and projections cannot be accepted. As an example, the A-36 chart which lists the allotment acreage by ownership credits the subject allotment (5058) with 2,030 acres of State and private acreage. In reality, the allotment contains 2,309.34 acres of private land and 80.00 acres of State land for a total of 2,389.34 acres. This is a discrepancy of 359.34 acres (over 15%) in a simple matter of addition.

85-2 Another example: The A-49 chart indicates there is one (1) watering facility on allotment 5058 and proposes one (1) additional. The allotment actually contains three (3) windmills, one (1) dirt tank, at least one (1) spring, and one (1) live stream. To construct an additional watering facility a person would have to be nuts or be using someone else's money - or perhaps a combination of the two in the case of the preparers of this DES.

Response 85-1

The total acreage for allotment 5053 is correct. There was an error found in the ownership of 320 acres. These 320 acres were found to be private and should be subtracted from the public lands total. The total acreages should read 2,270 private, 80 state, and 2,805 public lands. There are 39 acres in section 24, T. 11 S., R. 26 E., which according to our records are on the east side of the allotment boundary fence and thus cannot be counted in the allotment total. This small of an error would not invalidate the total forecasts and projections, therefore, Table A-2 has not been changed. The corrected acreage figures would be used in determining grazing capacity when a decision is issued.

Response 85-2

The chart on A-49 only indicates the existing and proposed approximate improvements on federal lands. The BLM is aware of some range improvements existing on private and state lands. However, additional improvements on federal land may be necessary. These will be planned in consultation with the permittee, after the ES has been completed.

The prior owner of allotment 5058 worked in Midland, Texas, during the week and lived at the ranch on weekends. The BLM would not permit him to chain his cattleguard as this would deny public access. As a direct result of this BLM policy, the "public" entered upon his private land and completely destroyed his ranch house. All windows were broken, doors removed, holes knocked in walls and ceilings, and his generator and other valuable items were stolen. I note that the BLM expects vandalism to increase when the East Roswell ES is implemented.

I have not yet secured legal assistance in this matter but expect that I will have to eventually. It seems to me that the carrying capacity of allotment 5058 is a property right which cannot be taken from me without due process.

Sincerely,

David J. Sorenson

David J. Sorenson

cc: Congressman Harold Runnels
Senator Pete Domenici
Senator Harrison Schmitt

STATE OF NEW MEXICO

Department of Agriculture
GOVERNOR'S CABINET

Box 3189, NMSU Campus
Las Cruces, New Mexico 88003
Phone: (505) 646-3007

BRUCE KING
Governor

WILLIAM P. STEPHENS
Secretary

86

July 26, 1979

Mr. James H. O'Conner
District Manager
Bureau of Land Management
P.O. Box 1397
Roswell, New Mexico 87801

Dear Mr. O'Conner:

This letter is intended to serve as written comments on the East Roswell Draft Grazing Environmental Statement.

86-1 The proposed actions under the Environmental Statement (ES) should not be implemented at this time, because it was developed with insufficient data upon which to base a proper management program. Although the Bureau of Land Management (BLM) is under court order to develop the grazing ES's, they are not required to develop specific action programs until adequate information is available. According to my information, the BLM also has not developed, as mandated by the Public Rangelands Improvement Act of 1978, the allotment management plans "...in careful and considered consultation, cooperation and coordination with the lessees, permittees, and landowners involved, the district grazing advisory board... and [the] State..." which has land within the area covered by the allotment management plan.

86-2 The subject pertaining to "intermingled" Federal, State and private land has not been adequately addressed. The same basic problems apply to this situation that are now under legal proceedings relative to the Rio Puerco Grazing Environmental Statement. Until the legal problems are resolved, further actions by BLM that impact on State or private lands should not be implemented.

86-3 I am certainly not opposed to proper range management practices being applied to BLM lands. However, the vegetative data was collected during 1977, which was a dry year and are woefully inadequate to justify implementing such far-reaching proposals. The New Mexico State University's Range Improvement Task

Response 86-1

See Response No. 14-2

Response 86-2

See Response No. 74-1

Response 86-3

See Response No. 7-1

Mr. James H. O'Conner
July 26, 1979
Page 2

86-3 cont. Force has presented comments on the methodology involved to accumulate the range inventory data and to determine the carrying capacity which resulted in adjustments in the stocking rate. I basically concur with their comments. I am strongly opposed, however, to the proposed actions that will result in an initial average livestock reduction of 28 percent.

The proposed actions essentially provide for "range improvement" through adjustments
in livestock numbers, by manipulation of grazing pressures with various grazing
systems and revegetation and/or brush management. However, the distribution and
abundance of rabbits and rodents--prairie dogs, kangaroo rats, and gophers--have
86-4 received only brief mention. The following statement is made in the Draft ES on
page 2-19: "A complete list of mammals using ES area habitats is found in Appendix
2, 'Major Habitat Types and Related Animal Species'." However, I fail to find this
list presented.

86-5 Rabbits and rodents eat, and they impact to some degree on rangeland conditions and the ability of the rangeland to "improve." While 3,114 AUM's have been allocated to "Wildlife" (includes only mule deer and pronghorn antelope) there has been no forage allocation for rabbits and rodents. If for example, based on information and proper data on such aspects as rodent distribution, abundance, and food habits, the rodent population is determined to be impacting the rangelands, a rodent control program should be included in the proposed actions.

86-6 The Environmental Statement states that there are currently between 350 and 400 prairie dogs utilizing the ES area but that they do not conflict to any significant degree with grazing programs. This implies that few prairie dogs are found in the area. However, a recent cooperative survey conducted by the New Mexico Department of Agriculture, U.S. Fish and Wildlife Service and the Cooperative Extension Service showed that in Lea County alone, 76 of 167 returns had prairie dogs on an estimated 13,041 acres of state and private lands. Implementation of the ES at this time would indirectly affect (manage) these lands. The ES should point out this information and emphasize that prairie dog - livestock competition could be a problem within the ES area. These type of data are not presented, and a control program is not addressed, but this is a management practice that could result in lower livestock reductions.

86-7 To clarify your records, page 2-20 lists the bobcat as a furbearer and Appendix II, Table B-7 lists the bobcat and coyote as furbearers. However, in New Mexico these two species are predators, they are not classified as furbearers.

86-8 The economic impacts of the proposed actions are frightening. According to the Draft ES, the initial livestock reduction would amount to 28 percent and the average ranch income would drop by 50 percent during the 1980s. Most likely some rancher's income loss would exceed 50 percent and they would be forced out of business. Probably many others would also be forced out of business, with or without, outside employment. Their ability to borrow money against ranch collateral might be reduced to the point that outside employment would not compensate. Forcing these taxpaying ranchers out of business is certainly not

Response 86-4

It has been established in scientific literature that high populations of rodents and lagomorphs can inhibit range improvement on ranges which are in poor condition. However, in the ES area, vegetation production in test plots, following herbicide treatment, significantly improved even though high numbers of rodents existed. For this reason, the BLM does not envision rodent control as part of any range management project at this time.

Response 86-5

Forage allocations were only made for livestock and big game which presently occupy the ES area. Information was not available to determine forage allowance requirements for insects, rodents or lagomorphs. However it is recognized that these animals do utilize rangeland forage. The proper use factor for plant species (55 percent of the annual growth) takes into account their use and is considered to be for their welfare.

Response 86-6

It is probable that most, if not all of the 76 responding ranches are located outside the Roswell Grazing District in Lea County. As a result, the BLM would not actively supervise livestock use on these ranches. Our survey showed no prairie dog towns on allotments scheduled for specific grazing management so no control of prairie dogs would be anticipated.

Response 86-7

Page 2-20 and Table D-7 have been corrected.

Response 86-8

The direct and indirect impacts of the proposed action would be felt chiefly in the ES area and in adjacent parts of southeastern New Mexico. Employment and income impacts on the ES area or the region would not be large enough to significantly affect conditions in the state or nation. Neither short-run reductions nor long-term gains in beef production would be large enough to affect price or supply of beef state-wide or nationally. Projected effects of the proposed action are chiefly those described for ranch operators with allotments in the ES area which would be placed under "specific grazing management." It is beyond the scope of this ES to assess the cumulative impacts of the proposed action and all other BLM proposals within the state.

in their best interests, or that of the surrounding local communities or the State. If you add to this ES the effects of all the planned ESs for the State, the impact could be very serious to the economy of New Mexico.

Obviously there are many unanswered questions and unknown ramifications pertaining to the impacts that could result from the implementation of the proposed actions. Mr. Art Zimmerman, State Director, BLM, was a guest speaker today at the annual New Mexico Wool Growers' Convention in Las Cruces. During his presentation entitled "Ranch Evaluation on BLM", he stated that the Grazing ES's are not in themselves a "decision document"; rather they serve as a basis for decisions to be made at a later date. He went on to say that BLM does not know exactly how to proceed to fulfill all of the various mandates and procedures imposed by Congress. He listed several examples including:

1) how to implement coordination and consultation with the district grazing advisory boards, the State of New Mexico, and the New Mexico Range Improvement Task Force; and

2) that an evaluation of existing AMP's is necessary at this time.

Mr. Zimmerman also stated that ranchers, and others, have maintained that data collected during one or two years is insufficient upon which to base these profound management practices. Zimmerman stated that "I fully agree," but does not have the luxury of time to gather additional data.

It appears to me that since the ESs are not "decision documents" and the BLM is not legally mandated to implement actions based upon the data in the ES's, that a prudent approach would be to use the ES's as a basis from which to start. I strongly urge that the proposed actions be postponed until:

1) adequate information is available to prepare and implement a biologically and economically sound management program on land administered by BLM, and

2) solutions are found to the problems enumerated by Mr. Zimmerman.

Thank you for your consideration.

Sincerely,

W. P. Stephens

William P. Stephens

July 28, 1979 **87**

Mr. James H. O'Connor
District Manager
Bureau of Land Management
P.O. Box 1397
Roswell, New Mexico 88201

Dear Mr. O'Connor;

In regard to the public hearing on 7-17-79 concerning the East Chaves, Eddy, and Lea county Enviroment Draft, I agree with the statements made by Sen. Pete V. Domenici, Sen. Harrison Schmitt, Rep. Harold Runnels, and Bud Eppers. It is extremely important that we receive a six month extension to comment on this critical document.

As projected, the grazing reductions would immediately force a number of ranchers out of business. How many more would it put in a marginal position only to be put out of business in the near future by galloping inflation, high interest rates, and a depressed cattle market? How many more will be put much nearer this position, eliminating the opportunity for sons and daughters to continue the family ranching business in the next generation? How can you recommend reductions of this magnitude based on one time samples and no other considerations?

87-1 I also believe that your projection on how many ranchers the reduction would put out of business may be many times underestimated. As an example, consider a cow-calf ranch now permitted to run 300 AU year long with only a 45% debt load. With 55% equity this operation seems pretty secure doesn't it? WRONG! Applying current interest rates, operating expenses, livestock prices, a very tight budget, minimum salaries and few employee benefits, this operation would barely break even. Now add guaranteed inflation, reduction in real estate values (equity) because of BLM interference, and uncertain weather and market conditions. This operation is extremely vunerable not to mention any reduction in the potential carring capacity.

This "overgrazing" issue has been blown out of proportion and exploited by environmental groups. As you indicated publicly;" probably less than 10% " of our public lands suffer from overgrazing. Lets work together and put the management on the problem not the progress.

Sincerely,

James W. Childress

James W. Childress

Response 87-1

The sharp decline in net cash income to ranchers resulting from initial adjustments in permitted levels of grazing on public lands is discussed in Chapter 3. Because of the temporary nature of the proposed cuts, no assumption was made that ranch operators would be "put out of business," but rather the figure of 10 to 15 ranchers was for persons who would have to find other sources of income, or part-time or full-time non-ranch jobs. There is no question that the proposed action would represent an economic hardship, or that it would temporarily disrupt ranch operations.

United States
Department of
Agriculture

Soil
Conservation
Service

Box 2007
Albuquerque, NM
87103

88

July 26, 1979

Mr. Tom Kiddoo
Public Affairs Specialist
Roswell District, BLM
P. O. Box 1397
Roswell, New Mexico 88201

Dear Mr. Kiddoo:

This office received copies of the East Roswell Draft Grazing Environmental Statement, dated June 8, 1979.

Our review of the DES was based upon information presented in the statement itself as well as on existing SCS reference data of the resources in the East Roswell Area. SCS has not conducted any special surveys or investigations to acquire additional information for use in preparing our comments.

The Section - "Description of the Environment-Vegetation" including Table 2-1 "Existing and Potential Forage Production" furnishes sufficient details about the forage resources for reasonable predictive capability. The methodologies used (appendix 1), are basically widely recognized and accepted procedures. We feel that the way in which SCS procedures and data were incorporated into the methodology represents a valid component of the system.

We do have the following specific comments about soil and forage resources and grazing implications:

88-1 In several places within the draft it is inferred that active duneland, riparian, rockland, wasteland and badlands are named SCS range sites. This should be clarified. Although they are miscellaneous land types (a kind of land), they are not described "range" sites.

88-2 Thoroughout the draft, the assumption is made that in areas of brush invasion no beneficial vegetative change would occur without some method of brush manipulation. On page 3-15 of the draft, the study that is discussed would disprove this assumption. We suggest these relationships be restated, and expanded to include the anticipated vegetative response to grazing systems without brush management.

Response 88-1

The soils portions of the ES have been changed to refer to these sites as "land types."

Response 88-2

The study referred to on page 3-15 suggests that invasion of mesquite seedlings may be deterred on low-lying sites where there is a dense growth of forbs and grasses. There are approximately 39,000 acres which fall into this category. There are over 960,000 acres of mature mesquite where the growth of forbs and grasses can no longer compete with existing brush. Therefore, without brush manipulation, no substantial vegetative improvement could be expected.

Response 88-3

The text has been revised to more clearly define this phenomenon. However, it was simplified to keep it in layman's terms to the extent possible.

Response 88-4

The assumption being made in this ES, is not that all communities will or could reach "climax" or excellent condition in 20 years but rather that, through control of brush and proper grazing management, forage production could reach the level which would occur on a range site that is in excellent condition. The species composition may not be in the proper ratios to constitute "climax" or, for that matter, excellent condition. It is not the intent of this ES to determine forage production by using the condition classes for a range area, but rather to reflect potential production levels.

Response 88-5

Range site names or soil surface textures are not very indicative of the water holding capacities of soils. Generally, particle size classes used for family differentiation is a better indicator. The majority of the soils in the ES area have particle size classes which reflect moderate -to-high water holding capacites.

88-3 The statement is made, first sentence of 3-8, that the soil is "hummocky dunes around mesquite plants and with packed sand between dunes." The soils of "interspace" between dunes are actually the argillic horizon exposed by wind action. Perhaps this needs correcting.

88-4 Although range site production is given for favorable and unfavorable years to reflect variability in precipitation and other climatic factors of the potential plant community, the interpolation or prediction that all communities will reach "climax" or excellent condition in 20 years is questionable. In addition, assuming various production levels by condition class is equally questionable. However, secondary succession will be promoted by range improvement practices.

88-5 On page 3-18, the statement is made "soils having high water holding capacity." This is not consistent with the predominant soils which are sandy.

88-6 Page 3-22, "dune land" is a miscellaneous land type not a soil type.

88-7 Table 6-1 page 6-6 infers that 133,000 AUM increase for each year beyond 2000. Is this stated correctly?

The Section - "Description of the Environment-Wildlife" furnishes sufficient detailed and specific information for the reader to understand the faunal relationships.

88-8 On page 2-16, a correction should be made to indicate that the list of animals associated with each habitat type is to be found in LISTINGS L1-L8. Also, on page L-5, the heading "Riparian Habitat" would more accurately be "Aquatic," since all species are fish.

88-9 The section "Environmental Impacts-Wildlife" we feel presents a generally accurate assessment of anticipated impacts. There has been a relatively large amount of biological investigation of wildlife/mesquite control relationships in southeastern New Mexico. We suggest that additional information be presented on individual bird species, particularly scaled quail.

88-10 We also note that several pertinent studies have suggested that to reduce the negative impacts to wildlife habitat, mesquite spraying should be done in swaths, leaving unsprayed bands of mesquite. We suggest that the final ES should discuss the impacts of such "patterned" mesquite controls on wildlife, as an alternative technique of chemical brush control.

Response 88-6

The text has been changed to reflect this information.

Response 88-7

The term "each year" has been dropped to avoid misinterpretation.

Response 88-8

The text has been corrected on page 2-16 and pages L-1 through L-8.

Response 88-9

The wildlife section deals with animals that would respond similarly to impacts. Although, it may be more desirable to deal with the individual species within groups, the significant impacts have covered in the broader groupings. At the approximate 40 percent kill level of mesquite, little impact on scaled quail is anticipated.

Response 88-10

Concerning the patterned mesquite spraying, the use of tebuthiuron (Alternative #1) would lend itself to this technique since the percentage kill would be much higher than a picloram-dicamba tank mix. If we go with the tank mix, a pattern approach to spraying would probably be unnecessary since the percentage kill expected would average no greater than 40 percent at best. This would result in an effect offering more edge than swath spraying.

We feel that the Section "Economic Conditions" is generally well done and presents valid information and reasonable predictions.

88-11 The partial mitigation of income losses from reduced allotments which can accrue from increased value of each AUM (vigor--more calves--higher weaning weight--greater number of beef sold, etc.), while discussed on 3-60 may be understated in places like 5-2.

There are no identified prime or unique farmlands which will be impacted by the proposed project alternatives.

There are no SCS assisted projects within the East Roswell Area which would be negatively affected.

We appreciate the opportunity to review and comment on this grazing statement.

Sincerely,

AW Hamelstrom
A. W. Hamelstrom
State Conservationist

Response 88-11

The potential mitigating of income losses by ranchers, described in Chapter 3, is not assumed for chapter 5. Therefore, the effects of mitigating measure may be understated.

94

Charles R. Martin, Inc.
210 SOUTH EIGHTH STREET
ARTESIA, NEW MEXICO 88210

July 27, 1979

Bureau of Land Management
Post Office Box 1397
Roswell, New Mexico 88201

Attention: Mr. Gerald Orr

Re: Proposed Adjustment of
Grazing Lease No. NM 065 6605

Dear Mr. Orr:

Confirming our meeting with you in April and our telephone conversation of July 24, 1979, we are most definitely in opposition to any decrease in our present grazing lease allotment. In the past, we have practiced conservation of this resource, and have, on occasion, not used our total allotment. It varies with increased rainfall and other related factors. This year we will use all of the allotment. In our opinion, to have a forced decrease for three years with an allotment based on a survey conducted under drought conditions merits immediate reconsideration. 94-1

Our Congressmen have been most cooperation in attempting to assist us in any way possible. It is hopeful that the deadline for implementing this environmental statement can be delayed until there has been consideration given to this mass of material and to understanding its actual effects.

Your prompt consideration of this matter will be appreciated.

Very truly yours,

CHARLES R. MARTIN, INC.

By Charlene M. Ward

CMW:ja

cc: Senator Pete Domenici
Senator Jack Schmitt
Representative Harold Runnels
Representative Manuel Lujan, Jr.

Response 94-1

See Response No. 7-1

El Llano Estacado
Resource Conservation and Development Area
P. O. Box 1168 ■ Tucumcari, New Mexico 88401
Telephone: (505) 461-3535

99

COUNCIL OFFICERS
Joe Cortese, Chairman
George Hay, Vice-Chairman
Opal Snipes, Sec.-Treas.

July 27, 1979

United States Department of Interior
Bureau of Land Management
C/O Tom Kiddoo, Public Affairs Specialist
P. O. Box 1397
Roswell, NM 88201

Gentlemen:

99-1 It is the opinion of this Resource Conservation and Development Area Council that the East Roswell Draft Grazing Environmental Statement carries many erroneous or otherwise misleading statements, and that the proposed action and alternatives exceed the authorities of the Bureau on non-federal lands. Further, the consequences should these alternatives be implemented, to the people of the area, the state and the nation are too severe. This opinion applies equally to the alternative of "No Action" which would fail to recognize the need for constant adoption of new methods and practices needed to perpetuate the benefits of the area's grazing resources.

It is important to recognize that grazing land resources are beneficial to man, primarily because of the ability of livestock to convert products otherwise unsuitable to man into consumable red meat. The additional benefits of wildlife, wildlife habitat, watershed, etc., while certainly important and worthy of every consideration for sustainment, are nevertheless secondary.

With this in mind, we would like to suggest an alternative not considered in the statement. This alternative is aimed at improved relations and respect between your agency, the landowners and users, other technical agencies of the state and federal government, and local leaders, coupled with a desire to sustain both the agriculture business and the livestock production.

The federal government must become cognizant of this opportunity and provide the necessary funding, inter-agency authorities, and personnel needed to meet this need. The landowner, too, in our opinion, must recognize that he has a responsibility and must face the issues with an attitude of cooperation. He must become receptive to gaining more knowledge of how to produce and manage his forage just as he has learned to manage and produce livestock. To

Response 99-1

See Response No. 74-1

accomplish this will require a commitment and conserted effort on each person's, and agency's part. It must be accomplished with the development of a mutually acceptable improvement and management plan for each acre of land under one unit of responsibility.

Sincerely,

Joe Cortese

Joe Cortese
Chairman

100

Lovington, New Mexico

July 24, 1979

Mr. James H. O'Conner
BLM District Manager
Box 1397
Roswell, New Mexico 88201

Dear Sir:

We have been notified orally by your representative that our cow allotment of approximately thirty years will be reduced by approximately 39% over a three year period.

We wish to vigorously protest this cut for the following reasons:
This ranch will more than support this number of cattle as we have proven five years ago when we set up our first rotation and deferred grazing system.
We asked for and received additional grazing for 35 more cows. Then you asked us to set up a grazing system of high density, low frequency grazing.
This system was tried for four years but the rain did not come at the proper times so when you made the forage count you are now going to penalize us as the result of your own grazing system. We protest this very much as you made your count two weeks before the rains came so you did not get a true picture of forage available for the balance of the year. Also you are penalizing us more than 39% as we had an additional 35 head on the grazing system first set up five years ago. 100-1

We hope you wil reconsider this matter for next year and make a recount of the forage available and get a true picture of this ranch.

Very truly yours,

Slash ML Ranch Inc.

By L. G. Caudill, President

Response 100-1

See Response No. 7-1

104

July 26, 1979

To Whom It May Concern:

RESPONSE TO THE NEW MEXICO EAST ROSWELL GRAZING ENVIRONMENTAL STATEMENT

This statement is to let it be known that we as owners and operators protest the drastic cuts that are proposed because:

104-1

1. The survey was made in a severe drought.
2. The amount of forage was not tied to the amount of rainfall or the number of cattle units actually on the allotment at the time, thereby making this an arbitrary cut.

There has been no overstocking by ranchers on ninety per cent of the range allotments.

BERRY RANCH

D. C. Berry III
D.C. Berry

Philip Berry
Philip Berry

Response 104-1

See Response No. 7-1

111

HEALTH ENVIRONMENT department
STATE OF NEW MEXICO
ENVIRONMENTAL IMPROVEMENT DIVISION
P.O. Box 968, Santa Fe, New Mexico 87503
(505) 827-5271
Thomas E. Baca, M.P.H., Director

Bruce King
GOVERNOR

George S. Goldstein, Ph.D.
SECRETARY

Larry J. Gordon, M.S., M.P.H.
DEPUTY SECRETARY

July 13, 1979

Kate Wicks
Planning Division
505 Don Gaspar Avenue
Santa Fe, NM 87503

RE: REVIEW OF EAST ROSWELL GRAZING DRAFT ENVIRONMENTAL STATEMENT

Dear Ms. Wicks:

The prime concerns of the Environmental Improvement Division about the proposed project are the following.

111-1 1. What will be the effect on the ground and surface waters from the Picloram and Dicamba applications?

111-2 2. What will be the effect of the Dicamba and Picloram applications on the future generations of the non target animal populations such as toads, lizards, shrubland birds, rabbits, bobcats, coyotes and mule-deer?

If you have any questions contact me at 827-5271, Ext. 354.

Sincerely,

Delbert Bell

Delbert Bell
Environmental Scientist

DB:mr

QUAL OPPORTUNITY EMPLOYER

Response 111-1

Analysis on pages 3-24, 3-25, and 3-26 indicates there would be no adverse effects on ground and surface waters from the application of picloram and dicamba.

Response 111-2

Pages 3-27 and 3-32 deal extensively with the effects of dicamba and picloram on different groups of animals. No carcinogenic, mutagenic or teratological effects were evident when these two chemicals were fed orally to test animals.

29 July 1979 112

Bureau of Land Management
Roswell District Office
Roswell, N.M.

Dear People:

I would like to thank you for your efforts in putting together the E.S. for the East Roswell Grazing Area. I'm sure there were many hours spent in compiling & writing so much material. I don't agree with all the ideas & material presented but on the whole, what I've read so far, it is well presented.

However, I would like to go on record as being opposed to some of the ideas & procedures set forth in the E.S.

I realize you are working under a time limit & also under pressure from the public & political figures, but I feel some things could be done in a more fair manner. The main things I'm referring to are: not working closely enough with the ranchers & the State Land Office; not a long enough period 112-1 of time given to the grass survey (I feel it should be done at the end of an average rainfall yr.);

(cont.)

Response 112-1

See Response No. 7-1

pg. 2

& also not enough time for comment.

The idea of what you are setting out to do is very good but what bothers me is the sometimes inconsiderate ways in which these ideas are carried out. I'm sure that is one reason bureaus have gotten a bad name (that plus all the "red tape"). Those people directly involved in this E.S. must work it out together through consideration & compromise, at peace not at war. The love & proper care of the land should be the concern of all people. But also, we must love & care for each other, not just people we like & not just on Sundays.

Thank you for your consideration of this letter, sincerely written.

Regards,

David T. McCrea

114

July 27, 1979
P.O. Box 655
Carlsbad, N.M. 88220

Mr. James H. O'Conner
District Director
Bureau of Land Management
P.O. Box 1397
Roswell, N.M. 88201

Re: Edna Angell
et al Permittee
Vivian G. Larson

Dear Mr O'Conner:

I wish to protest the content of East Eddy County Environmental Draft in that:

114-1 a. I think more than one test of our range forage should be run before a decision is made. As you know the test was run in early summer before our summer rains and since we do not receive spring rains and snow nothing grows until summer rains — and too, that year of the test we fed our cattle until July 1.

Response 114-1

See Response No. 7-1

b. Rotational close grazing in this part of the State ruins the land — close grazing leaves no old grass to shade the ground under this desert sun and wind erosion in the sand is disastrous.

114-2 Please, let's spray mesquite; fence more pastures; provide more waterings and try testing our forage in the fall of the year

Response 114-2

See Response No. 7-1

114-2 cont. (useing your first test as a base to start from) and then make some adjustments in livestock numbers if it is necessary.

I live on this ranch and its been family since turn of century – and honestly we have more grass basically than has ever been here.

Thanking you for reading my thought

Sincerely

Vivian G. Larson

I agree with the man who said you should be our buffer against all the bureaucrats and protect us your tenants,

Mr. Ernest Harwell
Dunken Route
Pinon, NM 88344

117
July 27, 1979

Mr. James H. O'Connor
District Director
Bureau of Land Management
P.O. Box 1397
Roswell, New Mexico 88301

Dear Sir:

We are writing this letter concerning the East Roswell Draft Grazing Environmental Statement done by United States Department of Interior, Bureau of Land Management, New Mexico.

We have read this environmental assessment and feel that you haven't given a lot of people enough time to state the tremendous impact of these proposals. We know the imput concerning the bulk of this seems to be very slanted. We have attended enough meetings and listened to enough people to know something is seriously wrong. You have completely ignored
117-1 the past and future economic impact out of this report. You have left out and didn't take any consideration in the private and state lands that are mixed with your federal land. Ranches were bought and paid for on a basis based on Animal Units of a ranch. Banks, IRS, and all other agencies base everything on this. We feel the amount of work done resulting in such a terrific impact is slanted and biased.

The statements in the Roswell Daily Record newspaper of July 26 seems to blame the ranching industry for all the problems. We, therefore, feel that the state land office, every rancher, state planning office, governor, and etc. should have more time to respond to this. We also personally feel the intent of Congress and Judicial branch of our government never intended that the livelihood and income of the state should be so regulated and be at the mercy of interpretation being made law by federal employees working in a federal agency.

We wholely support Mr. Eppers of Southeast New Mexico Grazing Association, governor, state planning office and any other people to stop this type of report and action.

We are sending copies of this letter to every representative in the state of New Mexico and hoping that if our opinions cannot be heard of felt through you concerning this matter then maybe the federal or state government representatives could someway stop or control your agency.

Ernest Harwell
Ernest Harwell

Response 117-1

The ES describes additive impacts on use of state and private lands in Chapter 3 and does specifically calculate impacts as the value of ranches and the borrowing power of ranchers.

122
Queen Route
Carlsbad, New Mexico
July 30, 1979

Gentlemen:

RE: East Roswell Grazing
Environmental Statement

Was allowing approximately twenty days for public comment on such a lengthy volume which took approximately three years and several million dollars to compile and compose done as a deliberate means of limiting comment?

This document is highly repetitive speculation based on given assumptions (chapter 3, pages 1 and 2). These assumptions are so broad that they destroy any creditability of the data included. While it is necessary to make assumptions in this type of study it is also necessary to examine the effects on the action as the factors contained in the assumptions vary, because they most certainly will.

The economic and social consequences of this action are very harsh. The economic consequences to the newer and younger livestock men who are starting out in the area will be disastrous. They will probably be forced out. What kind of out side work will a permittee in the 50+ age brackett have available to him in the area? The time frame (20 years) of this plan may be appropriate for a federal agency, but for an individual permittee it may be forever. To a permittee 50 years old it may well be the rest of his lifetime.

122-1 The portion on brush control probably should have been less specific as to the chemicals and rates of application. As this portion is written BLM may be committed to a procedure which has been used only experimentally and in a different area. The brush control portion of this action is contingent upon labeling of picloram and dicamba in a tank mix.

122-2 The reductions in livestock numbers on individual allotments is questionable because the data upon which it is based was collected over such a short period of time. This is especially true when the extreme variations in local rainfall (both amount and location) are considered.

Response 122-1

The purpose of the specificity of chemicals and rates of application is to be able to analysis specific effects. If chemicals having less effect are identified or variations in rates for application are necessary, evalutations of modifications would be accomplished in a specific environmental assessment record.

Response 122-2

See Response No. 7-1

The added 25% reduction in numbers in brush control areas is probably unnecessary on allottments scheduled for substantial reductions. The implementation period for brush control is based on a seven year time period; five years for the actual control, followed by a minimum two year rest period. The provision is included to extend this period until the desired effect has been achieved. These desired results may never be achieved considering the specific plan of action (specific chemicals, specific rate, ect).

Figuratively, you have put all your eggs in one basket, and will force great hardship upon those individuals most directly involved.

Respectively,

David H Kincaid

David H. Kincaid

DHK/jk

123

Dear Sir;

I take this form of expressing myself on the EIS of the East Roswell District.

The time alloted for response is too short for those who do other things for a living to be able to seek qualified help to respond in a responsible manner.

The transects leave much room for error (human) and no positive way for re-checking when they are not marked. Also there is too much lee-way for differences in methods among the many people involved, regardless of prior instructions.

The percentage of grazing reduction seems high even when the economic impact on an area is not a consideration at all. It seems odd you, the Bureau, continuously speak of multiple use, but seem very set on "punishing" ranchers, mineral extractors, etc. who are assisting our country maintain a good standard of living.

123-1 I do not know the procedure used for figuring grazing capacity for a long period, but do not understand how a single forage check during a drought or short rainfall period can give an accurate or true indication of the situation.

Thank-you for the opportunity to express my view.

Sincerely,

George M. Casabonne
Box 9
Hope, N. Mex 88250

Response 123-1

See Response No. 7-1

124

July 30, 1979

Dear Sirs,

I would like to make a protest against the Environmental Impact Statement of B.L.M.

We bought our ranch at $1000 a cow ~~Statement~~ unit. We have 1600 deeded acres. Our permit is for 165 cattle now, but is to be cut to 102.

We are now only able to make the payments of over $11,000.00 a year by the current permit and already have outside jobs to pay for own personnel living. If we are cut by over 40% we will loose our ranch along with most of the other small ranchers.

It isn't fair for the small ranchers to be pushed out so the larger ranchers or foreigners can buy up our land. It will not be a democracy anymore but be the government running everything and the people not having a real vote left.

124-1 We also feel we were evaluated wrong in 1977. We had very little rain that year + our permit was raised by 2 head. And in 1978 we had over 35 inches of rain & have already had 10 inches this year & their wanting to cut us.

Our ranch is located Southeast of Hagerman + our permit number is N.M. 064-6165.

Sincerely,
Mr + Mrs. George [illegible]

Box 145
Lake Arthur, N.M.
88.

Response 124-1

See response 7-1

126

July 28,1979
Mr. Tom Kiddoo
Public Affairs Specialist
Roswell District, BLM
P. O. Box 1397
Roswell, NM...88201

Dear Sir:

May I take this method of expressing some comments on the Environmental Impact Statement for the East Roswell Grazing District? I am very opposed to it's present form.

Insufficient time is given to even review it properly, as it is hard to read and comprehend and no time was allowed to enlist professional help.

126-1 There were no markers left on the sample areas, so it is impossible to re-run the inventory. Or even to know, for sure, that anyone was actually there. No notice was given to the ranchers as to the exact time the work would be in process so it was not possible to observe. It is impossible to make a proper range analysis based on one or two years study of a given area, in any case.

126-2 This draft constitutes Federal control of Private, and State, lands that are inter-mingled with Federal lands. It includes no "cost-benefit" study to substantiate the proposed (so called) improvements. Due to the unpredictable nature of rainfall in the area, it is not practical to set rest periods for any given area, by the calender. One thing it does show, is that allotment management plans in effect now prove that the BLM, managing of grazing is not a success, by any stretch of the imagination.

Fencing of dirt tanks would be foolish. The livestock watering there continually compact the bottoms of the tanks which makes them retain the water they catch. Without the compaction they will not hold water. Some credence should be given to they many years of practical experience of the ranchers.

Most ranchers are too old, and not qualified, to hold a job away from their ranches. Not only would, such a cut in livestock, be a serious financial blow to the ranchers involved, but to the economy of all related businesses.

I request that a six month extension of time be granted, to study the DES and to get an unbiased group to spot check and verify the findings of this DES.

Sincerely,
Hugh M Kincaid
Hugh M. Kincaid
Queen Route
Carlsbad, NM...88220

Response 126-1

See Response No. 7-1

Response 126-2

See Response Nos. 13-1, 82-1, 82-5, and 82-

Roosevelt Natural Resource Conservation District

127

P.O. BOX 359 PORTALES, NEW MEXICO 88130

July 26, 1979

Tom Kiddoo
Public Affairs Specialist
Roswell District, BLM
P.O. Box 1397
Roswell, New Mexico 88201

Subject: Draft Environmental Statement East Roswell Grazing
Dated: June 8, 1979

It is apparent that manhours and money was of no concern when compiling this document. The facts are so intermingled with theory that it is hard to distinguish one from the other.

127-1 B.L.M. land is so interwoven with state and private land that when implementing this draft, 3.1 million acres of state and private land will be directly affected and be subject to the same deferred use as proposed for Federal Land. This would be unconstitutional. Adoption of the B.L.M. plan would require fencing of all B.L.M. land, which would, in combination with the resultant loss of land (grazing) revenue, result in an unnecessary, large increase in the local and national tax burden. This draft if adopted would be a disaster to the local people and would add a major burden to the state of New Mexico and the Nation.

Response 127-1

See Response No. 74-1

In these times of public unrest and the Nation's unstable economic condition, it is not conceivable to propose removal of a source of revenue and cut the production of red meat. Not only B.L.M. land, but then 3.1 million other acres (private and state) would also be taken out of production. This will drastically increase the price of red meat and put its purchase out of reach of most citizens. It may also break many ranchers.

It is thus considered that B.L.M. should take immediate action to implement a program of range improvement with each individual land owner or user of B.L.M. land, patterned after The Great Plains Program, which would permit utilization of the land to its fullest capacity by both domestic animals and wildlife. This calls for concentrated effort on the part of both the Federal Government and the land owner or user in the realization of their respective obligation and duties, to work together in establishing such a program. Principal measures to be included are:1.long -term leases and cost-sharing
2.provision for effective water supply systems including pipelines and drinking tubs
3.cross fencing
4.brush and weed control
5.fertilizer and grazing systems of a flexible nature regardless of land parcel ownership.

It must of course be realized that in most cases rainfall is the controlling factor of all grazing systems and for them to work they must be flexable to insure proper management practices.

CONSERVATION · DEVELOPMENT · SELF GOVERNMENT

To implement this program, continuing coordination between the land owner or users and the B.L.M. will be necessary. One means of accomplishing this would be thru establishing some form of range mangement school with all parties having respective imputs and responsibilities. Hopefully each party will complement the other in attaining the desired results.

Let us emphasize again, that non use of range land will not necessarily result in its improvement. This has been shown by some of the work done at College Station and on the Jornada Experimental Range. Continued wise use and mangement of range land for the benefit of all parties concerned is the best possible solution to this problem.

If this organization canbe of any assistance to you in implementing this program, please contact us.

Sincerely,

George Hay

George Hay
Chairman
Board of Supervisors
Roosevelt Natural Resource Conservation District
Portales, New Mexico

SECURITY NATIONAL BANK of Roswell

P. O. Box 1858 . . . Roswell, New Mexico 88201, Telephone (505) 623-3501

130

July 31, 1979

Mr. James O'Connor, District Manager
Bureau of Land Management
PO Box 1397
Roswell, NM 88201

Dear Mr. O'Connor:

Enclosed is the statement from the Chaves County Agriculture Council concerning the BLM proposed grazing cuts as a result of the environmental study east of Roswell, whereby the Council goes on record opposing the Bureau of Land Management proposal.

Sincerely,

George M. Fernandez
Vice President

GMF/spo

/Enclosure

STATEMENT PREPARED FOR THE BUREAU OF LAND MANAGEMENT

In response to the EIS East of Roswell,
by George M. "Corky" Fernandez, Chairman
Chaves County Agriculture Council

The following comments will be brief and are only a few of the highlights of the effects which, in the opinion of the Chaves County Agriculture Council, will result of the actions proposed to be taken by the Bureau of Land Management Environmental Study.

First of all, the Council feels the time allotted by the Bureau for the public to review and respond to the study was entirely too short. Due to the abundance of reading material included in the study, it has been difficult to analyze and determine the magnitude of results of the proposed actions in the time allotted to respond. The Council requests an extension of time (90 days at least) for public input.

Secondly, the Council questions the qualifications and experience of the Roswell Bureau of Land Management staff to collect and interpret experimental data to propose major changes in Range Management practices of the magnitude it has presented in the Environmental Study done East of Roswell. Most of these ranchers have operated in this area for a great number of years, oftentimes a lifetime, observing through trial and error, what types of livestock, number of livestock, and combination of livestock species respond best to the availability of forage and conditions on these ranches under consecutively varying climatic conditions.

130-1 Yet Bureau staff members new to and relatively unfamiliar with the livestock industry and the area propose major changes as a result of one year's data collected. This one year (1977) also showed to be one of lower rainfall than usual. In view of this, the Council recommends that more extensive data be collected and more consultation with long-time ranchers should be done, inquiring as to why he uses some of his regular practices.

Response 130-1

See Response No. 7-1

Some of these practices might be incorporated with BLM proposals and possibly result in a more practical management plan. After all, ranchers have lived "off the land" and have years of experience which may prove to be priceless if incorporated with BLM studies.

Thirdly, unlike gross income, fixed operating costs on a ranch remain basically the same within increments of several hundreds of livestock. Therefore, a reduction in the livestock number of a ranch would result in a drastic reduction of income but not reduce expenses by the same proportion. Also, some ranchers in the area have developed genetically superior breeding livestock achieved at tremendous costs and dependant upon maximum return on investment in order to exist. A cut in their number of livestock would create a devastating blow to the repayment ability of their continuous investment to maintain the quality of these livestock.

130-2 This has created much concern to area financial institutions as they provide many of these investment and operating monies. Many existing loans in the area are dependant upon maximum annual income of these area ranchers or the refinancing of their ranching units. It is becoming more evident that ranch units subject to BLM management are having less and less borrowing power for operating and purchasing loans than those not subjected to such management. In many cases, permanent financing and operating costs have been in existance and repayment will become most difficult with the proposed grazing cuts.

Most of all, we are beginning to see that the true successors of the Agriculturist--his son and daughter--our youth of America, are becoming more discouraged through imposed and oftentimes needless regulations of farming and ranching operations. They are being driven to compete with their city cousin for jobs rather than doing what they learned best through the experience of growing up with it, and that is to provide

Response 130-2

See Response No. 78-20.

food and fiber for the city cousin by the most efficient and the least expensive means possible. Maybe it is time that the public--the American Taxpayer--should become aware of how his tax dollars are being spent by the government agencies and how the ultimate effect is increased prices of his food on the table, clothes on his back, and his energy sources during an era of great economy and energy concern.

In summary, the Chaves County Agriculture Council recognizes that in a few individual cases some changes may be necessary; however, drastic changes could prove more detrimental and the proposal cuts of stocking rates across the board as proposed in the environmental study are unrealistic and unjust to ranchers that went into their ranching operation in good faith and with a long term commitment with a large financial outlay in doing what he has done.

George M. "Corky" Fernandez, Chairman

GMF/spo

THE RIO GRANDE CHAPTER OF THE SIERRA CLUB

131

P.O. Box 25271
Albuquerque, NM 87125
July 30, 1979

Mr. James H. O'Commor, District Manager
Bureau of Land Management
P.O. Box 1397
Roswell, NM 88201

Dear Mr. O'Connor;

I have reviewed the East Roswell Draft Grazing Environmental Impact Statement for the Rio Grande Chapter of the Sierra Club. The data presented indicate that it is absolutely necessary that AUMs be reduced in the near-term to a level which the forage of the land can sustain. We strongly support that proposal. To do otherwise is to knowingly allow the continued deterioration of the range which would be in violation of your responsibility to manage the public lands on a sustained yield, multiple use basis. To do otherwise would allow the continued deterioration of the land to the point where grazing would be impossible, wildlife habitat would be all but destroyed, and soil erosion and water pollution from silt would be intolerable.

The data is well presented and, in general, the findings are intelligibly presented in summary form in the tables. The long and short-term impacts seem to be adequately presented.

131-1 Our primary criticism of the EIS is that the alternative chosen would destroy too much of the brush land wildlife habitat for the sake of presumed improved grazing forage. In addition we are greatly concerned about the overall environmental impact of chemical treatment of brush over such a large acreage in only eight years. Is there precedent for such widespread treatment of brush, and, if so, what were the observed results? If there is no precedent for such widespread use of herbicides we would strongly recommend a more moderate approach.

131-2 For the sake of preserving habitat we would recommend greater buffer zones than those listed on page 1-21. It would be useful to find in the EIS an estimate of the brushland acreage which would not be sprayed because it served as buffer between sprayed areas and tanks, ponds, nesting sites, cliffs, canyons, and draws. 464,000-900,000 acre reductions in brush habitat for small game, lizards, insects, and birds is a tremendous impact which we find totally unacceptable.

Response 131-1

Even though control of brush is a range management goal, it would be beneficial to wildlife. On pages H-30 and A-31 of the DES, the Management Framework Plan (MFP) states that wildlife interests would also like to reduce mesquite and creosote canopies to 10-15 percent in order to reclaim habitat for grassland species. The BLM considers this an important wildlife objective for several reasons. First, over 200,000 acres of former shortgrass habitat has become invaded by brush due to improper use of forage, the effects of climate and the absence of prairie fires. An additional 250,000 acres of grama/bluestem rangeland has succumbed to shinnery oak and mesquite. Reducing brush densities would not only increase forage production for livestock, but would improve habitat conditions for grassland-associated wildlife.

Even if heavy brush mortalities occur with retreatments, the "patchy" effects of herbicides would leave scattered areas suitable for brush-adapted wildlife, particularly predators and shrubland birds. Additionally, historic brushland in the ES area-mixed desert shrub habitat on poor soils, would remain for shrub-adapted animals.

Spraying with the proposed herbicides will not result in a "monoculture" of rolling prairie. It should be kept in mind that herbicides are being used to reclaim grassland, not to convert one historic community to a disclimax.

No shrub-adapted species would be severely reduced in range by this proposal, rather several classified species would benefit. (See pages 3-41 through 3-43).

Large-scale applications of picloram and dicamba would be needed to achieve adequate results in forage production and to reverse the trend of advancing brush into shortgrass demands large areas to efficiently use aircraft and the short period of the year when sprays are effective.

Response 131-2

The large acreage proposed for chemical treatment seems less imposing when it is realized that the overall area to be sprayed will be divided into smaller portions so that public lands on only about one fourth of any ranch area would be treated during any given year. This would result in effects of the treatment being scattered and taking place over a several year period of time. In addition, the anticipated brush kill of only about 40 percent is not expected to change the brush cover aspect which otherwise could result in sudden ecological changes. With retreatment, changes may be cumulative to the point where grassland species would benefit and shrub-adapted wildlife would decrease on the historical grassland areas, some time beyond the short term time period of 20 years.

Response 131-3

It does not seem likely that coyotes would turn to livestock predation following a drop in rodent numbers. Several factors would account for this. Coyotes are opportunistic omnivores and would probably switch to plant and other prey species more readily available should

131-3 We question the projection that decreasing populations of rodents will eventually lead to a reduction in the coyote population by asking what will happen in the interim. After rodent populations fall off significantly because of habitat destruction, but coyote populations have not yet adjusted will coyotes seek domestic animals more frequently and will this lead to greater pressure for predator control?

131-4 It is assumed that onsite analysis of areas proposed for inclusion in projected brush control treatments would be made to avoid highly desirable wildlife habitat and cultural resources (pg. 3-2). We believe that this analysis must be done prior to finallization of the EIS.

131-5 As mentioned above it is quite unclear the acreage which will be excluded from control and the present vegetation on these buffer zones and exclusions. Table A-6 implies that 17 locations of trees will be excluded and that each of these is approximately a 1/4 section. However, Table 6-1 seems to indicate that the total acreage of broad leaf trees saved will be 10 acres. This is a ridiculously small area and it is quite deceptive to mention it at all as "preserved habitat" (pg. 3-38).

131-6 While we welcome the 76,822 acres which will be left without brush control because no specific management plans are anticipated, we note the projected deterioration of that land, presumably due to over-grazing, and request an explanation of why no management is proposed.

131-7 Page 3-39 mentions 21 allotments which would have exclosures set aside to provide nesting habitat for lesser prairie chickens. Is this included in a table and what total acreage is involved?

131-8 Fencing information is totally vague. Fences should allow antelope movement and the EIS should specifically address this issue. There is no documentation (pg. 3-39) for the statement that "movement problems for antelope would be minimal" while on pg. 3-41 the statement is made "fences .. pose a hazard to deer and antelope."

In conclusion, we commend the BLM for a basically well-developed draft EIS. We urge modifications in the planned action to reduce the destruction of wildlife habitat and we caution against the proposed extent of herbicides use without sufficient experience to anticipate secondary effects of such massive alteration of ecosystems in a very short period of time (8 years).

Sincerely,

Phillenne D. Howard

Phillenore D. Howard, Ph.D.

Response 131-3 (cont.)

lagomorph numbers drop drastically. The ES area has not had a history of serious coyote damage when predator-prey populations have fluctuated. Induced fluctuation in prey numbers caused by brush control programs would not result in any abnormal change in coyote food habits.

Response 131-4

Onsite analysis of brush control projects by allotment would be conducted prior to the actual application of the herbicides. Timing of projects, choice of grazing systems, locations of waters etc. would be done in consultation with the permittee. Environmental Analysis Records, subject to public inspection would analyze and mitigate all range improvement projects as they are specifically identified to determine the effect on all resources.

Response 131-5

Table A-6 describes the locations of tree groves down to the quarter section, i.e., location. This does not refer to the size of the grove. The 17 groves, range in size from 2,500 square feet to one acre in size. These 17 groves are the only trees out of 50 scattered groups that are suffering from livestock damage and since damage is evident they would be protected.

Response 131-6

Some of the acreage involved in the 76,822 acres on "no specific management" areas is deteriorating due to grazing. Other areas are subject to light utilization but are still expected to deteriorate since mesquite has been spread into these areas by livestock and wildlife. Once mesquite and creosote are established, further infestation and range deterioration is imminent even on range sites which are in good condition.

The only way to "control" management on these isolated tracts would be through fencing, which is a costly alternative.

Response 131-7

Exclosures for lesser prairie chickens are listed on page A-47 and would total 6,565 acres (page 1-6).

Response 131-8

Fences would be designed to fulfill multiple-use objectives, including free movement of wildlife. Fences built to BLM standards, include types which allow free movement of antelope and deer. However, as stated on pages 3-39 and 3-41, any fence poses difficulty for big game. This statement is based on observations which have been made by BLM specialists.

133

202 Three Cross Drive
Roswell, New Mexico 88201
July 23, 1979

Mr. Art Zimmerman
State Director
Bureau of Land Management
P. O. Box 1449
Santa Fe, New Mexico 87501

Dear Sir,

As taxpaying residents of Chaves County, lifelong residents of the State of New Mexico and concerned citizens of this country, we wish to protest the "East Roswell Draft Grazing Environmental Statemant".

We agree whole heartedly with the statements given by U. S. Senator Pete Dominici, Mr. Bud Eppers and the ranchers and responsible citizens who spoke at the "Public Hearing" in Roswell on July 17, 1979. We cannot agree with Jean Herzegh who read the prepared "Sierra Club" statement. It becomes obvious that the Sierra Club is surely made up of people very similar to those in the Bureau of Land Management.

You people do not seem to realize, or even want to attempt to understand that it is the rancher today, as it has been for the past 50 years or more, who has actually been the greatest contributor to the preservation of the public lands. Without the rancher's private dollar invested in windmills, water carrying pipelines, fencing to insure utilization of the grasses and forage and to help in pasture grazing rotations we would hate to think of what condition the range would be in today.

Specifically, the wildlife including big game animals, small game, birds, rodents, etc. would only survive in this area along a very narrow strip along the Pecos River and it's very few tributaries. The efforts of the rancher, alone, by his private investments in watering facilities, well-spread throughout these public and private lands have allowed the wildlife to flourish. The rancher is not against wildlife. Almost all of the ranchers I know of are themselves hunters and sportsmen.

133-1 We submit that the scientific methods utilized by the BLM in their measuring process is not accurate. The range surveys do not represent a true picture of forage. No one knows the true condition of the total forage available for grazing better than that rancher who is on the land, watching it day by day, year after year. All ranchers agree that over-grazing of the lands hurt them in the long run. You cannot starve a profit out of any animal!

Response 133-1

See Response No. 7-1.

2

We submit that no governing body, including the BLM, can manage these lands so as to improve anything without the full support and co-operation of the rancher. Now, instead of creating an atmosphere of co-operation and support, the BLM is actually trying it's best to suppress, to ignore and to exclude the rancher.

The best management tool in any business is flexibility. One must note that the rancher seldom, if ever, stocks the lands up to his maximum allotment allowed under the "Taylor Grazing Act". Yet, he at least should have the opportunity to do so should the land receive proper rainfall. Isn't it better to graze off excess grass (Tibosa and Sacaton) than it is to let it grow, turn dormant, then burn the dormant growth back the following season?

The proposed cutbacks in AUMs or whatever term you choose to use, (We sometimes believe BLM is using AUMs and other fancy abbreviations to confuse the public), completely eliminates the tool of flexibility in managing the land. Further, it limits the flexibility of his market. He will be "locked in" to selling his crop, regardless of market factors, at a given time each year. With the tremendous reduction in grazing, we're afraid the rancher will simply place his full allotment on the lands, leave them there until BLM says sell. You are taking the rancher's incentive and initiative away from him, then asking him to co-operate and join in this "GREAT BUREAUCRATIC ABORTION" you seem to prefer to call "Management Planning". Again without a joint effort and full co-operation among the rancher, the citizens, sportsmen, outdoorsmen, birdwatchers, recreationist and the State of New Mexico Land Office, private landowners and the federal land watchers such as the "Bureau of Land Management" and The U. S. Forest Service the plan cannot work.

We must accuse the BLM of using a tactic associated with Dictatorships and Communist forms of government. That tactic is very obviously being done by design, not by accident. This tactic is to keep the ranchers divided up into small, "insignificant" segments, segregated by area. In wartime this was known as "Divide and Conquer". Hitler himself was one of the greatest tacticians in the history of the world.. He used the tactic well, but failed.

Specifically we accuse the BLM of "Dividing" each grazing district, going so far as to hold the hearings and public comment for each district at a different time, then skipping to even another state to present the ES there, allowing a cooling off period etc. In the Roswell District alone, the BLM chose to segregate the east from the west. It is obvious that they felt it would create and arrouse the ire of too many people at once to include the entire Roswell District in one EIS. In the East Roswell ES the BLM writer indescrimenately refers to the "Relatively Insignificant" number of people affected by the ES. He also continually uses the same terminology "Insignificant", when referring to the Economic impact of the area.

The BLM is attempting to coerce the public into believing that we have a very minute problem, dealing with a tiny population of renegade ranchers who do not wish to obey the law. Senator Domenici himself placed this in it's proper perspective when he stated to the BLM in part that he only wished the Nation as a whole, contained a much greater percentage of people who had the law abiding and moral fiber of the farm and ranching families of this country.

The BLM chooses to suppress the fact that there are over 210 of these separate Environmental Statements being prepared at a cost to the American Taxpayer of just over $100 million and this only includes the preliminary administrative cost of the study and proposal. We shudder to think of the cost of actually implementing the proposed plans.

In their attempts to suppress, the BLM refuses to admit these grazing plans affect livestock grazing in a total of eleven (11) western states, a total public lands consisting of hundreds of millions of acres, billions of dollars in income annually, losses of tax revenues of federal, state, county, and cities into the millions, to say nothing of the loss of revenue to a multitude of businesses in each town and city which will affect their income and taxes. It goes on and on. The BLM must be forced to print the truth, that these "Environmental Statements" affect grazing of livestock on all Federal Land, BLM and National Forrests, Bureau of Reclamation, as well as State Lands and much private, deeded lands intermingled among the public lands.

This Grazing Statement does not affect just an "Insignificant" 100 to 110 people in a little "Insignificant area of Southeastern New Mexico".

At this particular time, we do not think it is appropriate to make any constructive suggestions, though we very much desire the opportunity to do so when we feel we will be heard. At present, the Draft ES must be defeated before it is too late. Then we must start research to implement a workable plan. A plan which includes the assistance of those most affected, THE RANCHER.

We request an additional 180 days public comment period to allow the citizens of the state to evaluate for themselves the effect BLM's proposals will have on the local economy and to make their wishes known.

Respectfully submitted,
Lonnie R Harper
Pauline Robinson Harper
Lonnie R. Harper
Pauline Robinson Harper

cc: Mr. James H. O'Conner
cc: Honorable Pete V. Domenici
cc: Honorable Harrison Schmitt
cc: Honorable Harold Runnels
cc: Honorable Manuel Lujan

134

C. R. McNALLY, JR.
2608 Bay Meadow Drive
Roswell, New Mexico

July, 28, 1979

Mr. James H. O'Conner
District Director
Bureau of Land Management
P.O. Box 1397
Roswell, New Mexico 88201

Dear Sir:

This letter is in protest to the actions you intend to take as a result of the East Chaves, Eddy, and Lea County Environmental Draft.

134-1 In my opinion, the results of the range survey are inconclusive. A survey based on one years range production is unfair. Especially if that year had below average rainfall. A five year average yould be more acceptable. Another objection is the removal of the survey markers. This makes it impossible to go back and recheck in future years for any range and forage conditions improvement.

The people who earn their living on these lands are the best ones to judge the condition of the range. I'm sure there are isolated cases of abuse, but these persons will not survive for any length of time. The employees of the B.L.M. are not qualified to manage these lands. Most have a formal education, but very little practical experience. Experience is the best teacher. By your admission, the A.M.P.'s in use within the Eastern Chaves, Eddy, and Lea County Planning Unit were not effective. I think you need to reconsider your position.

Sincerely,

Scott McNally
Scott McNally

Response 134-1

See Response No. 7-1.

136
PAUL N. CREEK
SENIOR VICE PRESIDENT

July 24, 1979

Mr. Art Zimmerman
State Director
Bureau of Land Management
P.O. Box 1449
Santa Fe, New Mexico 87501

Dear Sir:

This letter is regarding the reassignment by BLM of the number of cattle to be run on various ranches, regardless of permit numbers. It seems ill timed when inflation is of so much national importance and the deletion of 9000 mother cows in this area cannot do anything but create a further shortage of beef and cause prices to continue to rise.

There are several things that cause me concern. One being the fact that the ranchers were not asked to be a part of the evaluation as they should know the land better than someone who is not familiar with this area. Another point I would like to make is the fact that the ranchers have more to lose than anyone else in the management of their own ranges. The few ranchers that have badly abused the land in the past just simply did not last as ranchers.

The ranchers that have made a living for twenty or thirty years on their respective places, have not been without concern for the range, or they would not still be there.

136-1 I ask that you do a study based on a five year minimum (not one or two years), as the full impact of any action done hastily can have far reaching effects on all of the western states and the nation as a whole.

Any consideration given my remarks will be greatly appreciated.

Respectfully yours,

Paul N Creek

Paul N. Creek
Senior Vice President

PNC/tb

cc: Honorable Pete V. Domenici
Honorable Harold Runnels

AMERICAN BANK OF CARLSBAD 115 W. FOX STREET CARLSBAD, NEW MEXICO 88220 505 885-8869

Response 136-1

See Response No. 7-1

138

July 25, 1979

Mr. Art Zimmerman
State Director
Bureau of Land Management
P.O. Box 1449
Santa Fe, NM 87501

Dear Mr. Zimmerman:

This is a formal protest of the proposed cuts in the East Roswell District. These cuts are extremely drastic. In my case 65% cut on a 1000 cow Ranch and 70% cut on a 100 cow Ranch which I have an interest.

I am just getting started in ranching. I am 29 years old and if these cuts go through they will put me out of the ranching business and will never be able to pay out for the rest of my life, let alone get another chance.

138-1 These cuts are based on 1 ~~test~~ dry year survey which in my opinion cannot possibly be a representative sample and does not justify this drastic a reduction in animal units.

I do appriciate the ultimate goal of improving the range condition but feel that this can be done without putting everyone, out of the ranching business in the process.

The 2 ranches Refered to are: Slash X Ranch (Tea Bates)
& Tom Brigham ranch

Sincerely
Malcom McCarty
Matt Irwin, partner Slash X Ranch
JT McAdams, partner Slash X Ranch

Response 138-1

See Response No. 7-1

139

July 27, 1979
Queen Route
Carlsbad, N.M. 88220

Mr. Art Zimmerman
State Director
Bureau of Land Management
Box 1449
Santa Fe, New Mexico 87501

Dear Sir:

Being a rancher in Eddy County, New Mexico, and a user of some Federal Land in my operation, I think you should know my feelings on the permit cut in East Eddy County.

You and I both know that no two years are alike as to weather or grass production, time of rain fall
139-1 and amount. An allotment can not be
increased or decreased on the basis of a grass study by persons who have never spent anytime making a business of ranching a success.

139-2 Further proof of this is that
ranches with an A.M.P., run by men

Response 139-1

See Response No. 7-1

Response 139-2

See Response Nos. 13-1 and 82-5

139-2 cont. of B.L.M., were cut more than the ranches run by cattlemen who have spent a life-time at making a success of ranching.

139-3 If a Grass study is made following a good amount of rain fall, it will show to carry two or three times the amount that it will show to carry after a long dry season with little or no rain.

These are only a few of the many good reasons that you should use in reconsidering your ruling to cut the allotments East of Carlsbad.

Yours truly,
Wayne Boles
4T + K Cross Cattle Co.
Queen, N.M.

Response 139-3

See Response No. 7-1

141

July 23, 1979

Mr Art Zimmerman
State Director
Bureau of Land Management
P.O. Box 1449
Santa Fe, N. Mex.

Dear Mr. Zimmerman,

Regarding the "Draft Environmental Statement on Grazing Management in the East Roswell Area", 141-1 we have been told by one of the heads of the Bureau of Land Management in our area, that public input on this matter will have no bearing on it whatsoever. Can this be true?

Whether or not the public has any say in what goes on in our country, I wish to go on record as being opposed to the adoption of this document.

I am in complete support of the statement made by Mr Bud Eppers of the Southeastern Grazing association and urge that this Draft Environmental Statement not be implemented.

Mrs Della Greenwood
P.O. Box 104
Carlsbad, N. Mex. 88220

Response 141-1

To the best of our knowledge, no statement to this effect was given by any office head or official spokesman. All comments dealing with the adequacy of this statement have been addressed in this document. All others will be considered by the District Manager in the development of management decisions.

143

P.O. Box 1873
Roswell, New Mexico 88201
July 26, 1979

Mr. Art Zimmerman
State Director
Bureau of Land Management
P.O. Box 1449
Santa Fe, New Mexico 87501

Dear Sir:

I have been superintendent of a 600 acre irrigated farm near Artesia, a 65 section ranch near the Capitan Mountains and an 85 section BLM ranch in west Eddy and east Otero Counties for the past 23 years. I have studied grasses, grazing systems, range and livestock management from available pamphlets and books and attanded short courses at NMSU, Texas Tech and the International Stockmen's School.

I have used pasture rest-rotation grazing on both ranches for the past 23 years. I have had an AMP with the BLM for the past 10 years. The improvements to range forage have been excellent and the records are available.

I feel that because of this experience, my suggestions or critism of the East Roswell Draft EIS should be given due consideration.

143-1 1. The forage surveys were made during one year only and at different times of the year on different ranches. At the time ~~these surveys were made~~, some ranches may have had good rains and some none. Generally, these were below normal rainfall years. A qualified range or forage surveyor must know the nature of our plants and grasses and their response on the different types of soil during both wet and dry periods. It is my understanding that these surveys were conducted by people trained and educated in areas that are not comparable to the plant and climatic conditions of New Mexico. It is also my understanding that, in many instances, these surveys are in disagreement with surveys conducted by the District BLM personnel, who are just as qualified by education and training as the people whose surveys were used in the EIS.

2. AMP's and Grazing System. During the past 30 years, many types of grazing systems have been studied and experimented with. These have had different results in different areas. One of the newest and different has been developed by Dr. Alan Savory of Rhodesia and is being implemented on the Spurlock Ranch in N.E. Arizona.

143-2 The point I would like to emphasize is there is no set grazing system that will be successful on a group of ranches or even one ranch in this area of New Mexico. Some of the factors that affect the success of a grazing plan include seasons of the year, rainfall, forage availability, labor available, livestock stress, water availability, calving, breeding and bull pastures and supplemental feeding. In my opinion, the BLM is as much at fault as the ranchers by not doing more in the past to educate the ranchers in range management and the monetary returns that could be realized.

Response 143-1

See Response No. 7-1

Response 143-2

The proposed action does not advocate set grazing systems for a group of ranches or an individual ranch. It only identifies rest, or deferment treatments that may be incorporated into grazing systems, at a later date.

In some cases, the BLM may have not used the experience and education of the ranchers in setting up the AMP's and not being flexible enough to have their cooperation. To ignore the economic impact or financial stress of the rancher adhering to a set plan during critical times does nothing but lower the integrity of the BLM itself and leads to mistrust of the BLM by those people who are informed of such actions.

Some of the areas that I may be in disagreement with in the EIS and the BLM's approach to AMP's are as follows:

1. Increase or decrease in livestock numbers on a ranch will come about naturally because of forage availability.

2. The use of more than 50% of the annual forage produced will not seriously damage the plants if allowed to regain their vigor when rainfall is sufficient.

3. More plants die from drowth then by overuse.

4. In very few cases is the decrease in livestock numbers necessary or advisable, if a rest-rotation grazing system is used.

5. The increase in livestock waterings and cross fences, together with brush control will generate faster range improvement than a decrease in livestock.

6. The desired results can be obtained by much shorter rest periods than is generally recognized.

I feel it would be a completely irresponsible act by the BLM, unfair to all BLM permittees, and not in the best interests of the public if the East Roswell EIS is implemented as is now proposed.

There needs to be more accurate surveys made over a longer period of time by qualified personnel and with the cooperation of the rancher and other land owners involved, before reductions in permits are made.

I also request that the public comment period be extended for a reasonable length of time to allow the affected ranchers and land owners to prepare their comments.

Sincerely,

S. Dewey Stokes

S. Dewey Stokes

SDS:mm

July 24, 1979

145

Mr. Art Zimmerman
State Director
Bureau of Land Management
Box 1449
Santa Fe, N.M. 87501

Dear Mr. Zimmerman:

The method the B.L.M. is using to obtain the E.S. for East Chaves County, which determines the carrying capacity, is not quite correct, I believe.

145-1 The State land office and private owners are not being consulted or brought in for ideas on the carrying capacity of each ranch. I think this cooperation is a Federal law and everyone should use it.

Sincerely,

Truman Pierce

Truman Pierce

Response 145-1

See Response No. 74-1

State of New Mexico

GOVERNOR
BRUCE KING

DIRECTOR AND SECRETARY
TO THE COMMISSION
HAROLD F. OLSON

DEPARTMENT OF GAME AND FISH

STATE CAPITOL
SANTA FE
87503

STATE GAME COMMISSION
EDWARD MUNOZ CHAIRMAN
GALLUP

J.W. JONES
ALBUQUERQUE

ROBERT H. FORREST
CARLSBAD

ROBERT P. GRIFFIN
SILVER CITY

BILL LITTRELL
CIMARRON

147

July 31, 1979

Mr. Tom Kiddoo
Public Affairs Specialist
Bureau of Land Management
Roswell District
P. O. Box 1397
Roswell, New Mexico 88201

Dear Mr. Kiddoo:

The New Mexico Department of Game and Fish has reviewed the Draft Environmental Statement, East Roswell Grazing Management Area, and wishes to make several comments. The overall general quality of the work seems to be good. There are some specifics and generalizations on wildlife that are inaccurate and, I would like to point these out.

147-1 Page 2-24, the upland plover has not been documented as breeding in New Mexico. Several species listed as endangered (pages 2-24, 2-27 and B-11 to B-12) are no longer in this category. Species which should be deleted include the Pecos pupfish, rainwater killifish, roundnose minnow, and little blue heron. Pages B-11 and B-12 should be checked for typographical errors. The Bald Eagle should be listed as a binomial (page B-11). The Audubon list of species is quite irrelevant to the ES area (pages 2-24 to 2-27 and B-14) as most of the listed species are not in jeopardy in New Mexico.

This department would like to be consulted during program development for the application of herbicides for mesquite control. The time interval recommended for use of these chemicals coincides with the production and rearing of young of most species of birds. Some areas which will be sprayed are near aquatic habitat of the Pecos River drainage where endangered species are present. For the above reasons, the department would like to be involved prior to herbicide application in this area.

I would like to support the Bureau of Land Management in its strict adherence to enforcing livestock trespassing incidents. Areas most likely to be trespassed upon are those areas, such as riparian, which are of most benefit to wildlife species and receive the most abuse from trespass stock.

Response 147-1

According to J. Stokely Ligon's book "New Mexico Birds and where to Find Them," page 117, upland plovers "...formerly nested along the east side of the state, but there are no recent breeding records." This agrees with the statement on page 2-24 of the environmental statement.

An up-to-date list of State endangered animals was just recently provided to the BLM by the NMDG&F, and is included in this final document on page B-11.

Limiting land management decisions only to those species of animals considered as endangered, threatened, sensitive, or of game importance would be shortsighted and not in keeping with goals set forth in the Federal Land Policy and Management Act of 1976. The Audubon Society's Blue List has been recognized by biologists as a valid early warning mechanism to alert land managers of disturbing population declines. Nearly all of the birds on the Blue List in the ES are showing declining trends in the southwest. By incorporating this fact into land management plans, BLM can better ensure that the habitat of Blue Listed species receives consideration. The management of relatively secure habitat is far easier than manipulating land uses in critical habitats. An active program dealing with unclassified wildlife and their habitat is a major step in preventing the fragmentation of animal populations and ranges which is always the first step towards their extinction.

147-2 I feel that it is commendable for the BLM to undertake the difficult task of bringing forage utilization and supply into perspective. I feel that wildlife should get its fair share of allotted forage within the EIS area. I feel that it should be further understood that forage allocations will be made to meet the present need of wildlife populations and that these allocations will be increased or decreased, as appropriate, when bringing wildlife to optimum carrying capacity. I feel that in the present allocation that the consumptive wildlife forage has been somewhat over allocated. I also think that wildlife's need for vegetation over and above consumptive utilization, in many instances should be recognized as proper and necessary to species' welfare. This forage should be indicated not for consumptive use but as cover for species' security and for food production for that species. The allocation of some forage which would be left for species' security would be very desirable, especially if that forage were left in a pasture which could be free of use during the entire year.

Thank you for the opportunity to review and comment upon the East Roswell Draft Grazing Environmental Statement.

Sincerely,

Harold F. Olson
Director

Response 147-2

Forage allocations to ungulates were made, based on density figures provided by NMDG&F, and BLM does not believe that it constitutes an over-allocation of forage. The only non-consumptive allocation of vegetation made was to lesser prairie chickens by limiting bluestem utilization. BLM would propose similar allocations for other wildlife, particularly non-game species, however, vegetation requirements (grass or shrub height, density, percentage composition, etc.) are not known for other animals in this area, so non-consumptive uses could not be apportioned.

150

United States Department of the Interior
BUREAU OF RECLAMATION
SOUTHWEST REGION
HERRING PLAZA BOX H-4377
AMARILLO, TEXAS 79101

IN REPLY
REFER TO: 150
706.

AUG 8 1979

Memorandum

To: State Director, Bureau of Land Management,
Santa Fe, New Mexico

From: Regional Director

Subject: Review of Draft Environmental Statement - East Roswell Grazing Management Area

As requested by a letter dated June 8, 1977, from your District Manager, Roswell, New Mexico, we have reviewed the East Roswell Draft Grazing Environmental Statement. The following comments are submitted for your consideration:

General

The environmental statement is well organized and adequately addresses the resources within the East Roswell management area.

Specific

150-1 Page 5-2, Livestock Grazing - This paragraph indicates that livestock stocking rates for all 184 allotments would be adjusted to the 1977-1978 range survey, resulting in a net decrease of 65,779 animal unit months of grazing. Also, we note that livestock adjustments would occur over an 8-year period. It appears that these long-term adjustments would be made based on only 1 year of range field data (Appendix 1, page A-1). Because of yearly changes in climate and rainfall, long-term major adjustments in livestock should be based on more extensive baseline studies.

Visual maps

Most of the visual maps (visual A, B, C-1, C-2, D, and E) could be improved by showing towns, major roads, and other landmarks for easier reference.

We appreciate the opportunity to review the subject statement. These comments reflect the views of the Southwest Region of the Bureau of Reclamation only.

Robert H. Weimer

cc: District Manager
Bureau of Land Management
Roswell, NM

Response 150-1

See Response No. 7-1

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Field Supervisor
Ecological Services
U.S. Fish and Wildlife Service
Suite C
3530 Pan American Highway, NE
Albuquerque, New Mexico 87107

152

August 1, 1979

Memorandum

To: District Manager, Bureau of Land Management,
District Office, Roswell, New Mexico

From: Field Supervisor, FWS, Ecological Services,
Albuquerque, New Mexico

Subject: Review of Draft Environmental Impact Statement concerning the East Roswell Grazing Management Area of Southeastern New Mexico (James O'Conner's June 8, 1979 letter)

As requested, we have reviewed the subject document and have the following comments to submit for your consideration:

General Comments:

152-1 We are concerned with allocation of forage projections displayed graphically on pages 1-5, 8-1, 8-8, 8-14, 8-21, 8-28 and 8-33. Projections are made for forage production increases resulting in increased livestock allocations. In general, big game (especially antelope) would be expected to naturally increase with improved range conditions. It is unrealistic to assume static populations and thus no increased demand of forage for big game. The management program should include monitoring of big game populations and flexibility should be provided to increase big game allocations should the need arise.

CONSERVE AMERICA'S ENERGY

Save Energy and You Serve America!

Response 152-1

Generally, improved range condition and increased forage availability would result in the expansion of big game herds, if these were the factors limiting populations. However, in this ES area, there are other factors not related to grazing but which are believed to limit populations. Should these other limiting factors be removed, forage allocations to big game would change, based on population changes (see discussion on pages 1-5 and A-19). At the moderate utilization level forage availability would not be considered a limiting factor to herd growth.

152-2 The draft environmental impact statement presents an erroneous assumption regarding displacement of wildlife species. Discussions on pages 8-5 and 8-11 indicate that mobile species will be displaced to other habitat areas. This assumes animals are not occupying the habitats at carrying capacity levels. If proposals for range management causes mobile species to migrate, overcrowding will occur in adjacent habitats and population responses over a period of time will bring population levels to carrying capacity. The obvious solution to this problem is habitat management emphasis to raise carrying capacities and thus provide compensation for impacts. Habitat management for the benefit of deer, quail and doves should be considered to mitigate for losses expected to occur from brush eradication.

152-3 On pages 8-20, 8-27, 8-31, 8-40 and 8-44, mention is made that "BLM is not committed to any mitigating measures to lessen or diminish identified impacts . . . Therefore, all impacts would be unavoidable." Decision makers could require implementation of alternatives as described in chapter 8. We submit that the BLM is mandated to develop mitigation measures for alternative agency actions. The Federal Land Policy and Management Act of 1976 mandates "that management be on the basis of multiple use and sustained yield"; that "...public lands be managed in a manner that will protect the quality of ecological, environmental, . . . that will provide food and habitat for fish and wildlife . . . and that will provide for outdoor recreation. . ." Thus, the BLM is responsible for mitigation of impacts and language in the draft statement should be changed to reflect these responsibilities.

152-4 Threatened or endangered species are mentioned on pages 1-34, 2-24, 3-19, 3-41-43 and B-11. The listing of species is not complete and should be updated to include the Pecos gambusia (Gambusia nobilis) which was listed October 13, 1970. Also, Table B-6 does not identify the peregrine falcon as Federally endangered. As mentioned on page 1-34, Section 7 consultation should be implemented should BLM determine that site specific activities have the potential to impact listed species.

Response 152-2

Overcrowding resulting from animal displacement is not likely to occur since mobile animals are less rigid in their habitat requirements than are non-mobile animals. Also, habitat management benefiting deer, quail, and doves is part of the proposal. The discussion on page 8-11 refers to that displacement which will occur at the time of treatment (only a few days). As brush control programs are implemented, livestock numbers would be adjusted to that level necessary to achieve a moderate forage utilization level. When used with periodic rest, these programs will improve carrying capacities of virtually all habitats. The greatest impacts of displacement are limited to mule deer and then only if tebuthiuron is used as the herbicide due to a percentage of kill on target species of about 40 percent.

Response 152-3

This quote, as presented is somewhat misleading in that it has been taken out of context. The entire sentence states "The BLM is not committed to any mitigating measures to lessen or diminish the impacts identified, other than those included in standard operating procedures, design features", (p. 1-24 through 1-27) "and those proposed for the proposed action in Chapter 4". (Emphasis added.) As stated on page 1-1, the proposed action is the result of the Bureau Planning System. The alternatives are also a result of that planning system. BLM Manual Section 1792.44E4 states "The responsible official ... must assure that all (mitigating) measures discussed and analyzed ... are real and committed ...". The intent of the statements made in Chapter 8 is that, at the time of preparation, BLM officials were not committed to any new measures. The standard operating procedures, design features, and stated mitigating measures would mitigate impacts to the extent possible under the multiple-use concept of management.

Response 152-4

The Pecos gambusia does not occur in waters fronted by public land in the ES area, nor does it occur in any areas impacted by watersheds controlled by the BLM.

The status of the peregrine falcon has been corrected on page B-11.

Specific Comments:

Page 1-4, first paragraph. Mention is made that base forage production was determined by the 1977-78 range survey. Further mention is made that forage production changes will be monitored. 152-5 Clarification is needed to indicate if monitoring will be accomplished in the same manner as the initial survey. It appears that forage production information based on one year of data would be limited in value. Range surveys for a period of several years would likely establish better data and provide a sound basis to make management decisions.

Page 1-31 Implementation Schedule. Mention is made that if forage responses do not reach anticipated levels of production, the implementation period would be adjusted and that livestock numbers would not be reduced more than the initial 25 percent at 152-6 any one time. This language appears to limit BLM's management options in the future. Certain conditions, such as extended droughts, etc., may warrant reductions of more than 25 percent It should be pointed out that livestock grazing is the principal use on the environmental statement area and livestock grazing should assume the principal responsibility for manipulation to obtain desired forage production levels.

Pages 3-27-31, Chemical Brush Control. Descriptions of impacts to fish and wildlife resulting from use of herbicide applications and resulting control of brush species are 152-7 generally adequate. However, the importance of monitoring during application of herbicides should be clarified. Observers should be used during application of herbicides to discover unanticipated effects and to prevent significant losses. Brush treatment will cause declines in brushland wildlife species. These losses could be prevented or mitigated by placing special habitat management emphasis on adjacent areas. Specific habitat management plans would require on-site determinations. Measures such as strip clearing designed to increase edge could accomplish mitigative effects.

Response 152-5

Monitoring would not be accomplished in the same manner as the initial survey. As stated on page 1-31, "As a minimum, the studies would be designed to include the annual livestock grazing use (actual), the degree of forage use (annually), the trend in range condition (over a period of time), and the climatic conditions (seasonally)." From the results of these studies, adjustments would be made in stocking rates. These studies will provide an ever increasing, sound basis for making future management decisions.

Response 152-6

The language of limiting livestock reductions to the initial 25 percent at any one time is in reference to the brush control treatments and their scheduling, not to other factors. Adjustments to conform to actual forage production and drought periods is discussed under Monitoring, Evaluation, and Adjustment on pages 1-31 and 1-32.

Response 152-7

Short-run losses of shrub-adapted wildlife would not be severe since the average kill of the proposed dicamba-picloram tank mix would be 40 percent. Long-run losses of habitat with retreatment or modified application methods following monitoring in the initial treatment areas could result in high brush mortality. The loss of mesquite-infested short and midgrass areas could be mitigated through the implementation of specific grazing management in mixed desert shrub areas.

Page 3-51, Recreation, Hunting. Mention is made that exclosures would promote concentrations of game birds and animals, create artificial environments, limit the challenge and the sport of the hunt and limit esthetic values associated with an outdoor experience. From this discussion one might assume that with livestock removed from the total area a hunting paradise would be created. This is not the case because of other limiting factors. Exclosures will undoubtedly improve natural carrying capacities and may improve game populations, somewhat. We would not agree that populations would be artificial or that esthetic values of hunting would be limited. In fact the reverse connotation is that livestock grazing creates artificial environments and may be the cause of reduced game populations.
152-8 This discussion regarding hunting should be redrafted and clarified.

In addition the term "game birds and animals" needs clarification. Perhaps this term should be rewritten "game birds and other animals" or "game birds and mammals."

Mention is also made that the present policy of "no specific grazing management" would detrimentally impact pheasant habitats along the Pecos River. Pheasant populations have been established under conditions of no specific grazing management and, while specific grazing management may increase pheasants, continuance of present management would not increase impacts to pheasant habitats.

The opportunity to comment on this draft environmental statement is appreciated.

Bob Pacific
Robert D. Pacific

cc:
Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico
State Director, Bureau of Land Management, Santa Fe, New Mexico
Area Manager, Phoenix, U.S. Fish and Wildlife Service, Phoenix, Arizona

Response 152-8

The recreation section dealing with hunting has been redrafted on page 3-52 to eliminate reference to artificial environment and pheasant habitat. The proposed action would have virtually no impact on these items.

154

STATE OF NEW MEXICO
NATURAL RESOURCES DEPARTMENT

BRUCE KING
Governor

WILLIAM S HUEY
Secretary

AUDI MIRANDA
Division Director

SOIL AND WATER CONSERVATION DIVISION
Room 110, Villagra Building
Santa Fe, New Mexico 87503
Phone: (505) 827-5182

August 7, 1979

Mr. James H. O'Connor
District Management
Bureau of Land Management
P. O. Box 1397
Roswell, NM 88201

Dear Mr. O'Connor,

We appreciate the opportunity to review and comment on the East Roswell Draft Grazing Environmental Statement. Our staff has studied the document carefully and offers comments which we urge you to consider when planning future actions.

Because of our mutual interest in conserving and improving land resources, we agree with your stated objectives to protect and improve grazing land, reduce erosion and provide food and cover for wildlife. We are also glad to support your committment, to multiple use, with strong emphasis toward managing public lands for livestock grazing.

Proposed increases in alloted grazing capacities as forage production increases indicates a willingness on the part of B.L.M. to adjust grazing allocations to forage production. We strongly support the concept of grazing management which balances forage production with forage use.

154-1 We strongly advocate grazing management systems, which provide for periods of use alternated with periods of rest, designed to meet physiological needs of range plants as well as providing optimun forage for grazing. The rotation grazing management systems outlined in the E.S. appear to be sound and should provide for improved range forage. We would strongly urge, however, that these grazing management systems be developed in consultation with the rancher and not be developed by B.L.M. staff then presented to the rancher for his concurrence.

Response 154-1

As stated on page 1-7, "Revisions would be made in consultation with the rancher involved" on the 20 allotments where "specific grazing systems" are already in effect. A sentence was changed on page 1-7, in the discussion concerning the 90 allotments where "specific grazing systems" would be developed, to show that consulation would also occur during the development process. This was an unintentional oversight.

The grazing systems chosen should take into consideration the ranchers operating procedures and his goals for the ranch unit.

Proposed action of chemical brush control is well planned with the objective of restoring the vegetation near original balance of grassland types.

Based on the range surveys conducted during the assessment period, present forage production data seems to require a reduction in AUM's to balance forage with use. This would represent an initial reduction of about 25% of presently allotted BLM's.

154-2 These forage production surveys conducted by a consulting firm in 1977 serve as base data for the proposed AUM allocations. Standard range survey procedures were followed and we agree with your use of weight estimates rather than forage acre factor based on density of cover that has been used in the past. We do severely question the proposed reduction of BLM's allotment for grazing on this one year estimate of forage production. We strongly encourage you to base alloted AUM's on the basis of annual forage production rather than an average established for a long period. This should provide for decreases in years of low production and increases in year of increased production.

We know that rainfall in this study area varies significantly from year to year and so does forage production. Local information indicates that rainfall was below normal, or the stated average, over much of the area studied during 1977. Forage production indicated in the survey may be a good basis for initially adjusting stocking rates but historical records along with current production should be used to adjust alloted AUM's annually. This could help reduce the economic impact of proposed reductions.

154-3 The E.S. presents very little information on weather, only average temperature precipitation and growing seasons, with no discussion of annual variations. There must be a more complete discussion of weather in the E.S. so its impact on forage production can be adequately evaluated.

154-4 In chapter 9 - Coordination and Consultation, there is no indication of any coordination or consultation with local Soil and Water Conservation Districts. We feel that lacks of contact or communication with SWCD's is a serious oversight on the part of B.L.M. Your agency has

Response 154-2

See Response No. 7-1.

Response 154-3

Weather is not expected to be impacted by the proposed action. The primary items discussed in this statement are those which the proposed action would impact either directly or indirectly. Variations in forage production due to drought is discussed on page 1-31 under "Monitoring, Evaluation, and Adjustment of the Proposed Action".

Response 154-4

A serious omission was made in Chapter 9 concerning the official recognition of coordination and consultation with local soil and water conservation districts. Comments have been received from the local districts and were considered in the preparation of this document. In addition, the conservation districts have been added in Chapter 1 under the section entitled "Interrelationships with other Federal, State and Local Programs". The BLM regrets the oversight and has every intention of working within the intent of the Memoranda of Understanding.

154-4 cont. memorandums of understanding with each district in this area in which you have agreed to work together for Soil and Water Conservation. Your agency has also entered a coordinated planning memorandums with various federal and state agencies along with the New Mexico Association of Conservation Districts to coordinate planning efforts on public and private lands. In carrying out this planning effort, you have apparently chosen to ignore their memorandums and agreements with these important local districts. We ask that in the future as you develop this planning effort future, you will honor these prior agreements and coordinate your planning with these local Soil and Water Conservation Districts.

Sincerely,

AUDI MIRANDA
Director

cc Bill Huey

New Mexico Association of Conservation Districts
STANLEY, NEW MEXICO 87056

155

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Box 33
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August 15, 1979

Mr. Tom Kiddoo
Public Affairs Specialist
Roswell District, BLM
P. O. Box 1397
Roswell, New Mexico 88201

Dear Mr. Kiddoo:

Thank you for the opportunity to review and comment on the East Roswell Grazing Draft Environmental Statement (DES). I have reviewed the document carefully and offer several comments for you to consider. Because our Association is committed to conservation of soil and water by wise use of lands, we support the goals of grazing land improvement, providing cover and food for wildlife, and your intention to continue multiple use of grazing lands.

Experience of soil and water conservation districts cooperators shows that grazing management systems, which provide periods of grazing alternated with periods of use, speed up range improvement. We therefore support proposed rotation grazing systems presented in the environmental statement. 155-1 These rotation systems must, however, be developed with the rancher, taking into consideration his operating procedures and his goals for the ranch unit. A grazing system should never be developed by BLM staff, then presented to the rancher for his concurrence.

The proposed reduction in AUMs will have a serious economic impact on the ranching industry in the entire area. For this reason we ask that you carefully review your proposed actions and continue AUMs alloted at the present level or with less reduction.

155-2 We realize the proposed reduction is based on a range survey conducted in 1977 and that this survey shows a need for reducing AUMs. Local records do show that rainfall and forage produced fluctuate significantly in this part of New Mexico. Since there is very little information on weather in the DES, we can't determine whether 1977 was an average year with average forage production. Inquiries within the local area indicate that rainfall and forage production were below average; therefore, forage production figures used to establish AUMs for the area may be too low.

Response 155-1

See Response No. 154-1.

Response 155-2

See Response No. 7-1.

Mr. Tom Kiddoo
Page Two
August 15, 1979

When establishing AUM allocations for ranch units, we would agree to an average level with flexibility allowed to increase AUM allocations in good years and decreased AUM allocations during years of lower forage production.

155-3 To reach the goals stated in the DES, with minimum economic impact to ranchers, it is imperative that sufficient flexibility be allowed in allotment plans in order to respond to current conditions. I was disturbed when reviewing the chapter on Coordination and Consultation to see that you have totally ignored the New Mexico Association of Soil and Water Conservation Districts within the DES area. Local districts include Lea, Roosevelt, Border, Carlsbad, Central Valley, Hagerman-Dexter, and Chaves. You have included such organizations as the Nevada Outdoor Recreation Council, but these local districts, which BLM has entered into memorandums of understanding with, have been bypassed in this planning effort.

The New Mexico Association of Soil and Water Conservation Districts has been very active in encouraging coordinated planning between federal, state and local agencies. We were one of the agencies which signed the most recent coordinated planning memorandum, yet our Association is provided little opportunity for consultation when this type of study is being developed.

Our Association is sincerely interested in soil and water conservation of all lands. We hope to be considered as further planning occurs.

Sincerely,

David King

David W. King
President

DWK:am

cc: Mr. Audi Miranda
All Regional Chairmen

Response 155-3

See Response No. 154-4.

Individuals Speaking at the Public Hearing in Roswell

July 17, 1979

1. Betty King (representing U. S. Senator Harrison Schmitt)
2. Gloria Koury (representing U. S. Congressman Harold Runnels)
3. Dan Berry, New Mexico State Representative

*4. Jerry Schickendanz, Range Improvement Task Force

*5. Phil Zwank, Range Improvement Task Force

*6. John Fowler, Range Improvement Task Force (representing self and Doctor James Gray)

7. Bud Eppers, Southeastern New Mexico Livestock Grazing Association
8. Phelps White, Rancher
9. Dorothy Helums, Homemaker
10. Gayland Townsend, Rancher
11. George Teel, Rancher
12. Ray Auge, Rancher
13. U. S. Senator Pete Domenici
14. Sam Morehead, Chaves County Commission
15. Jean Herzegh, Sierra Club
16. Philip Harvey, New Mexico Cattle Growers Association
17. T. L. Watts, New Mexico Wool Growers Association
18. Jim Stewart, Sierra Club
19. Bill Lee, State Representative

Individuals Speaking at the Public Hearing in Carlsbad

July 18, 1979

20. Betty King (representing U. S. Senator Harrison Schmitt)
21. Hart Greenwood, Chairman of the Board of Eddy County Commissioners
22. Johnny Vopado, Mayor Pro-tem of Carlsbad
23. Bill Dinwiddie, Rancher
24. Larry C. Squires, Rancher
25. Bill Gissler, Rancher
26. Don Kidd, President of Commerce Bank and Trust
27. David Sharbutt, Professional Engineer
28. Dan Davis, Associated Industry (Realty)
29. Bud Eppers, Southeastern New Mexico Livestock Grazing Association
30. Dan Liesner

*All comments by these individuals were responded to in Letter No. 78, submitted by Jerry Schickendanz, Coordinator of the New Mexico Range Improvement Task Force.

In addition, David Wassil turned in written testimony at the Roswell hearing. No response was required.

Hearing Participant No. 1:

Comment A: In some cases, BLM has used only one, if any, onsite inspection as acceptable criteria on which to base decisions or substantial cutting of grazing allotments. "It seems that, at least, three visits to the same area would be needed to provide sufficient information for BLM."

Response A: See Response No. 7-1.

Hearing Participant No. 3:

Comment A: That the actual rainfall be tied to any study that is made as to the amount of forage available. It will do no good to go with the average rainfall in this country, but is should be on each permit separately.

Response A: See Response No. 7-1.

Comment B: Take into consideration the effect of this plan will have on the tax base of the state, counties, and cities.

Response B: Tax impacts of the proposed action were not felt to be significant. Although market values of ranches would be less from the standpoint of banks considering loans, it is unlikely that a lower valuation for property taxes would be assessed because of the temporary nature of livestock adjustments.

Hearing Participant No. 7:

Comment A: Forage inventories were not sufficient for reestablishing stocking rates, assessing range conditions or trends. Stocking rates on public, private, and state lands have been arbitrarily set by agency personnel. This is not in compliance with the Range Lands Improvement Act of 1978. Private landowners nor the State Land Commissioner were granted the prerogative of establishing livestock numbers for their respective land holdings which are intermingled throughout the entire area. Intensive management systems or AMP's are still based upon the same inflexible, non-beneficial, rest rotation grazing system sought by the BLM for many years. If the grazing systems proposed were beneficial, BLM would not have had to reduce numbers on those ranching units presently under these systems more than those which were not.

Response A: See Response Nos. 7-1, 13-2, 14-2, 74-1, and 143-2.

Comment B: An economic impact statement should be included which totally and adequately show the true overall impacts to not only the ranchers but the communities, counties, state, nation, consumers and taxpayers. Until this is done, the economic picture will not be fully visualized.

Your economic summary does not adequately address the total economical impact locally, statewide or nationally. You have addressed the impacts all the way from horned toads to mule deer so why not the economic impacts to citizens in New York, Miami, Chicago and elsewhere?

Response B: See Response 86-8

Comment C: I would like to ask, does the cost outweigh the benefits? Should not a cost benefit analysis be included with this Statement?

Response C: See Response Nos. 64-5 and 82-1.

Comment D: Livestock and ranchers have been charged totally for the present condition of the range. What effects on badgers, prairie dogs, rabbits, squirrels, rodents, antelope, deer, skunks, porcupines, grubworms, grasshoppers, gophers, range caterpillars and drought have on the vegetation productivity and composition of the forage? These impacts have not been addressed nor mitigated in this DES. These forage users most certainly have some impact on the vegetation. Until these impacts are addressed in the proposed action and the alternative, this Impact Statement is not complete.

Response D: The Environmental Statement attempts to reflect the effects of the proposed action and the alternatives on the environment rather than to attach blame for the present conditions. The effects of badgers, prairie dogs, rabbits, squirrels, rodents, antelope, deer, skunks, porcupines, grubworms, grasshoppers, gophers, range caterpillars, and drought are natural factors which effect vegetative production and must be taken into account when determining what amount of the vegetation would remain available for livestock grazing. Their use of the rangelands do not provide an excuse for overuse by domestic livestock grazing. Forage plants can withstand only a given amount of use regardless of the animal which uses it. Under the proposed action, the level of use on forage plants would not be allowed to exceed moderate use (40-60 percent). The impacts of this use level has been addressed in the vegetative and economic sections of Chapter 3 in the final environmental statement.

Hearing Participant No. 11:

Comment A: What justification do you have for the proposed cut that you proposed?

Response A: See Response No. 7-1.

Hearing Participant No. 14:

Comment A: We also feel that the decision to cut the carrying capacity of range lands in New Mexico based on one survey of the ranching operation is unfair and unjustified. We question the amount of time the Bureau is allowing before proposing the implementation of this plan.

Response A: See Response No. 7-1.

Hearing Participant No. 16:

Comment A: The BLM has based its actions on studies made during some of the droughtiest years we have seen. This premise alone would tend to invalidate the whole analysis. When the transects on the various allotments were run, no permanent markings were used to show exactly where forage samples were taken on the ground. In short, the procedure used by the BLM to anlayze transects and their forage is invalid. I would urge that the transects that have been run previously be permanently marked as to exact locations if this is possible now.
Response A: See Response Nos. 7-1, and 27-2.

Hearing Participant No. 17:

Comment A: We oppose the methods used in taking the inventory of range forage...The transects were not properly marked and cannot be rechecked by an independent concern for a comparison.
Response A: See Response Nos. 7-1 and 27-2.

Comment B: The Bureau of Land Management did not notify the rancher as to when they would be checking their allotment so the rancher could accompany the crew on the inventory.
Response B: Grazing permittees in the ES area were informed by letter dated April 15, 1977, that a survey would be conducted, and that, if they had any questions, to please feel free to call. The Commissioner of Public Lands was also notified at that time. Another letter was sent to all permittees, dated August 8, 1977, informing them of an open house that was to be held regarding the survey and to answer any questions concerning it. Another letter dated September 14, 1978, was sent to ES area permittees informing them that rechecks were to be made.

Comment C: We oppose federal management of private and state lands as mentioned on Page 1-33. This is not in compliance with the Constitution, State Enabling Act, or the Range Land Improvement Act of 1978.
Response C: See Response 74-1.

Comment D: Range improvements are not defined as to type, size, and cost so they can be analyzed in the study.
Response D: See Response No. 64-5.

Comment E: The economic impact in this study appears small but it should be considered on a statewide basis as several more of these plans will be implemented in the next five years. We do not believe this study shows a true economic impact on these communities and the state of New Mexico.
Response E: See Hearing Response No. 7B. It is beyond the scope of the East Roswell Grazing Environmental Statement to assess the cumulative impacts of this proposed action and all other BLM proposals within the state and nation.

Hearing Participant No. 19:

Comment A: My main concern...was the time when your survey was taken...was a time of severe drought for many of us in this particular area in 1977.
Response A: See Response No. 7-1.

Comment B: ...contact and work through with the State Land Office. Our intermingled lands are going to give use nothing but a confrontation if BLM goes on head-long and does not give the State Land Office their opportunity for an input, their opportunity to make decisions on state lands.
Response B: See Response 74-1.

Hearing Participant No. 21:

Comment A: It is impossible to know what year is a normal year as to rain and climatic conditions. The only alternative would be for the studies to span several years.
Response A: See Response No. 7-1.

Comment B: The 28 percent reduction in all livestock numbers is not a true reflection of overall cuts since ranchers have already cut numbers by 17 percent voluntarily, due to extended drought in some areas. There is also mention of further cuts, if necessary, without any specific information as to how great they might be.
Response B: See Response No. 82-4.

Comment C: This Statement does not address itself to the billions of dollars it will cost to do the extensive brush control proposed, if this was done throughout the western United States, nor does it spell out where the money will come from.
Response C: See Response No. 64-5.

Comment D: Of the ranches that have been under Allotment Managment Plans under BLM, 90 percent of them are due for cuts.
Response D: See Response No. 13-2.

Comment E: There was not an extensive economic impact statement included, dealing with the severe economic impact that implementation of this Statement would have.
Response E: See Response No. 86-8.

Hearing Participant No. 23:

Comment A: I feel that this reduction is an unfair reduction, and I have several reasons that I feel this way; one is the period in which this range survey was taken...during such a dry period...I am concerned as to why this range survey was taken in the spring of the year...rather than in the fall of the year after our growing season...I feel that this proposed plan of reducing numbers penalizes us as ranchers in that we cannot take advantage of years that have adequate moisture by increasing our livestock numbers in an attempt to have more income.

Response A: See Response 7-1.

Hearing Participant No. 24:

Comment A: To my knowledge, during the time of the survey which was purportedly made, I was never contacted, nor was any of my employees contacted. As far as I know, the survey was never done...why weren't we contacted.

Response A: See Hearing Response 17B.

Comment B: It is my understanding that the survey was done in the summer of 1977, and the summer of 1978. Now, I was told, personally, that our survey was done first in the summer of 1977, and that he BLM personnel that I talked to, told me that they weren't satisfied, that the results were inconsistent, so they had them come back in 1978. But this was at a time of pretty severe drought...

Response B: See Response No. 7-1.

Hearing Participant No. 27:

Comment A: I noticed that there was one thing that was missing. Always in the studies that we present, we try to compare the benefits against the cost of any program.

Response A: See Response No. 64-5.

Comment B: ...there was no reference of weighing the economic values through time.

Response B: See Response No. 14-1.

Hearing Participant No. 30:

Comment A: This appears that the Environmental Statement was a oneshot survey put together in a series of bad drought years that has a lifetime implication.

Response A: See Response No. 7-1.

Comment B: ...input from residential experts was not solicited, nor accepted, that I know of. It appears that the experts compiling the data were selected in a fashion that do not represent local knowledge and/or experience on these ranges that are involved.

Response B: See Response 7-1 and Hearing Response 17B.

APPENDIX
I

APP I

Appendix 1

DETERMINATION OF FORAGE PRODUCTION FOR GRAZING ANIMALS

Procedures and methodologies used in determining the forage production for grazing animals in the East Roswell ES Area are summarized under three headings: Forage Production Inventory Methodology, Future Forage Production Prediction Methodology (by the Year 2000), and Range Suitability for Livestock Grazing. These discussions cover data collection, data compilation, development of proper use factor tables, animal forage requirements (pounds of forage per Animal Unit Month equivalents), and the criteria for determining the suitability of a range area for livestock grazing.

Forage Production Inventory Methodology

In 1977, a forage inventory of the East Roswell ES Area was completed by Rangeland Resources International, Inc., a scientific consulting firm with expertise in resource inventories, range management techniques, vegetation analysis, remote sensing, environmental analysis, and resource planning. The firm is located in Mancos, Colorado, and was organized in 1975. It had been engaged in ten resource-related projects prior to working on this forage inventory.

The forage inventory consisted of a weight estimate survey technique, and was made up of two major components: data collection and data compilation.

The data collection component consisted of determining the range vegetative subtypes in the ES area. These vegetative subtypes are relatively homogenous units of rangeland having similar plant composition and density. Inventories of these subtypes were limited to those portions contained within individual grazing pastures. The range subtypes were then sampled. This sampling consisted of (a) determining the best location for a transect to represent the subtype, (b) gathering data (using a pace technique along the selected transect line) from 9.6 square-foot plots spaced 600 feet apart, and (c) recording collected data. A minimum of one plot per transect was clipped and weighed by species, as a check on estimations. Plots were determined by placing a loop to define the plots at the point of the toe on the appropriate pace. The number of plots for an adequate forage sampling depended upon the complexity of the range subtype and the size of the type. Normally, range subtypes on areas ranging from 160 to 640 acres in size had ten plots sampled, those from 640 to 4,000 acres had twenty plots sampled, and those with 4,000 acres or more had one plot per 200 acres sampled. No transect exceeded 60 plots in length. Data was recorded as the green weight in grams (before it is dried) of each plant species on each transect. Allowance was made for the amount of utilization based on visual estimates and the estimated stage of current plant growth at the date of sampling. Extensive training to insure uniformity of estimates and accuracy of adjustments was conducted at the beginning of the survey period. To assure that accuracy was maintained, weekly sessions involving all estimators were held throughout the course of the survey. A green sample of each vegetative species was clipped and dried each week to determine conversion factors for final computations.

Data compilation consisted of totaling the green weight, expressed in grams, of each recorded plant species for all the plots along the transect within each range subtype, converting this value in grams of green weight to pounds of green weight per acre (gram weight for 10 plots = pounds per acre) and multiplying this figure by a moisture factor. This moisture factor was determined by periodically clipping and weighing vegetative species, and then determining the difference between green and dry wieght. These results would then be used to convert green weight to dry weight per acre (See items circled on form 4412-4 "Forage Survey Type Write-Up," for examples of these calculations). The pounds of dry weight per acre for each species were then multiplied by the proper-use factor for that species (for this use complex, the proper-use factor had been previously developed). See following discussion on proper-use factor (PUF) development. Game which is not considered to be in competition for forage with livestock was not considered in these calculations (noncompetitive game PUFs).

Development of Proper-Use Factor Tables

A Proper-Use Factor (PUF) table is an index table to the grazing use that may be made of forage species, based on a system of range management which will maintain important forage species. Certain forage species are preferred by grazing animals above others, therefore, the PUFs are different for each of these species according to preferences of grazing animals or to a combination of these preferences. For this ES area, the PUF values were determined by comparing field observations made in the ES area during the spring of 1977 with PUF tables which had been prepared for other BLM Districts in New Mexico. Areas chosen for field observations had been subjected to grazing by both livestock and big game. When discrepancies occurred between field observations and the existing PUF tables, adjustments were made to reflect the proper use for this ES area. No attempt was made to differentiate between livestock and big game use. A maximum allowable proper-use level was set, based on the physiological needs of grass plants. The reason for this decision to use grasses is that they are the most desirable forage plants in the area, used to some degree by both livestock and big game.

According to Dietz (1975), grass roots gradually stop growing when approximately 50 percent of a plant's leaf volume has been removed. Fifty percent of the root growth stops when 60 percent of the leaf volume is removed. Also, 30 percent of each grass plant's root system must be replaced each year (Dietz, 1975). Therefore,

FORAGE SURVEY TYPE WRITE UP
(WEIGHT ESTIMATE METHOD)

Write up No. WS-1

Sheet No. 1 of 1

Date 9-7-77

Aerial Photo No. 5-78-22

Examiner Weldon Sears	KIND OF ANIMAL* Cattle Deer Antelope	SEASON OF USE Yearlong	SECTIONS Portions of: 21, 22, and 28	TWP. 25 S.	RANGE 30 E.	MER. N.M.P.M
Type Latr - Creosote						

	SPECIES	1	2	3	4	5	6	7	8	9	10	TOTAL	LBS. GW/Ac	% DRY WT.	LBS. DW/Ac	PUF USE COMPLEX	PUF NON-COMP. GAME	LBS. UF/Ac USE COMPLEX	LBS. UF/Ac NON-COMP. GAME
GRASSES	Scbr	5	1			10	1	1		1		19	19	92	17.48	.10		1.75	
	Boer	1										1	1	87	.87	.55		.48	
	Sema			15								15	15	48	7.20	.45		3.24	
	Spfl			45	30		20					95	95	88	83.60	.50		41.80	
	Mupo			20								20	20	73	14.60	.55		8.03	
	Spcr							55	10	35	15	115	115	50	57.50	.50		28.75	
FORBS	Xasa	15	25	10	30	30	25	15	35	25	55	265	265	64	169.6	0		0	
	Unkann	7										7	7	61	4.27	0		0	
	Lefe	1	1		1	1				1		4	4	68	2.72	.20		.54	
	Cassia								1			2	2	62	1.24	.10		.12	
SHRUBS	Latr		1	1				1			1	4	4	-	-	0		0	
	Prju				1	1						1	1	50	.50	.05		.03	
	TOTALS																	84.74	

Use Complex 84.74 lbs. UF/Ac (tot.) × 100 % Utilizable 84.74 lbs. UF/Ac (Net) 770 lbs./AUM (forage req.) ÷ 84.74 lbs. UF/Ac (Net) = 9.09 Ac/AUM

Noncompetitive Game: ___ lbs. UF/Ac (tot.) × ___ % Utilizable = ___ lbs. UF/Ac (Net); ___ lbs./AUM (forage req.) ÷ ___ lbs UF/Ac (Net) = ___ Ac/AUM

Form 4412-4 (March 1965) (formerly 4-1276) USDI - BLM

* Livestock and major game species *(other game species making inappreciable use are*

60 percent removal of leaf volume would be approaching the upper limit for proper utilization while maintaining the potential vigor of the grass plant. To allow for errors in judgement, the PUF for the most palatable grass species was set at 55 percent. An area's most palatable grass species would normally serve as indicators of a change in range condition. Grazing management decisions would be based on the response of these indicators. The species having the highest PUF (55) are: sideoats grama (*Bouteloua curtipendula*) and black grama (*Bouteloua eriopoda*) in this ES area. Species in this category normally make up less than 20 percent of an allotment's forage production at this time.

There are very few desirable shrubs in the ES area which are important as forage plants (fourwing saltbush and range ratany are the primary ones). Normally they are scattered and make up a relatively small amount (less than 10 percent) of the total forage. Controlling the utilization of these shrub species is difficult and is normally limited only by the way they grow (growth form), to approximately 40-60 percent of the current year's growth.

The other forage plants such as sand dropseed, panicgrass, bluestem, plains bristlegrass, and many others which make up the bulk of the forage production in the area were then assigned PUF values based on their comparative use in conjunction with the most desirable species.

The results of these calculations of dry weights per acre for each species, times the proper-use factor for that species, show the estimated weight of usable forage per acre for each plant species (see circled items on Form 4412 - 4 for examples). The tally of all plant species is the total usable forage per acre for that range subtype. This value was then divided by a conversion factor which considers that 770 pounds of dry forage equals one AUM (See the following discussion on pounds of forage requirement for an Animal Unit Month).

Pounds of Forage Per Animal Unit Month Equivalents

In order to determine the amount of forage available for grazing animals, it is necessary to convert pounds of forage to the standard of animal unit months (AUMs). An AUM is the amount of forage needed to sustain either one cow, one horse, five sheep, 9.5 deer, or 14.5 antelope for one month. For this ES area, it has been established to be 770 pounds of dry forage.

The 770-pound figure is based on information given to BLM by New Mexico State University (NMSU). This information stated that 2.5 percent of body weight is a fair estimate of forage intake per day for mature cows, and 3 percent of body weight is a fair estimate for yearling animals.

With mixtures of cows, calves, and yearlings on the range, a representative figure was estimated, based on the NMSU information, to be 2.7 percent of average body weight.

FORAGE SURVEY TYPE WRITE UP
(WEIGHT ESTIMATE METHOD)

Write up No. WS-1
Sheet No. 1 of 1
Date 9-7-77
Aerial Photo No. 5-78-22

Examiner Weldon Sears	KIND OF ANIMAL *	SEASON OF USE	SECTIONS	TWP.	RANGE	MER.
	Cattle	Yearlong	Portions of: 21, 22, and 28	25 S.	30 E.	N.M.P.M
Type Latr - Creosote	Deer Antelope					

	SPECIES	1	2	3	4	5	6	7	8	9	10	TOTAL	LBS. GW/Ac	% DRY WT.	LBS. DW/Ac	PUF USE COM-PLEX	PUF NON-COMP. GAME	LBS. UF/Ac USE COM-PLEX	LBS. UF/Ac NON-COMP. GAME
GRASSES	Scbr	5	1			10	1	1		1		19	19	92	17.48	.10		1.75	
	Boer	1										1	1	87	.87	.55		.48	
	Sema			15								15	15	48	7.20	.45		3.24	
	Spfl			45	30		20					95	95	88	83.60	.50		41.80	
	Mupo			20								20	20	73	14.60	.55		8.03	
	Spcr							55	10	35	15	115	115	50	57.50	.50		28.75	
FORBS	Xasa	15	25	10	30	30	25	15	35	25	55	265	265	64	169.6	0		0	
	Unkann	7										7	7	61	4.27	0		0	
	Lefe	1	1		1	1				1		4	4	68	2.72	.20		.54	
	Cassia								1			2	2	62	1.24	.10		.12	
SHRUBS	Latr		1	1				1			1	4	4	-	-	0		0	
	Prju				1	1						1	1	50	.50	.05		.03	
	TOTALS																	84.74	

Use Complex 84.74 lbs. UF/Ac (tot.) × 100 % Utilizable 84.74 lbs. UF/Ac (Net) 770 lbs./AUM (forage req.) ÷ 84.74 lbs. UF/Ac (Net) = 9.09 Ac/AUM

Noncompetitive Game: ___ lbs. UF/Ac (tot.) × ___ % Utilizable = ___ lbs. UF/Ac (Net); ___ lbs./AUM (forage req.) ÷ ___ lbs UF/Ac (Net) = ___ Ac/AUM

Form 4412-4 (March 1965) (formerly 4-1276) USDI – BLM * Livestock and major game species *(other game species making inappreciable use are*

Based on observations of "sale barn" weights, a figure of 950 lbs. was used as the average body weight for animals over six months old on the range.

Using the above figures, the following calculations were made:

950 lbs./animal x 2.7 percent/day = 25.65 lbs./day/animal.

25.65 lbs./day/animal x 30 days (average month) = 769.5 lbs./animal/month. 769.5 lbs. rounded up to 770 lbs./animal/month or 1 AUM.

The above calculations deal only with animal consumption. No attempt has been made to quantify herbage removed through trampling, leaf breakage, and loss through fecal droppings. This vegetative loss, if significant, would be allowed for through adjustments based on monitoring utilization.

The resulting value, derived by dividing the total usable forage per acre by the conversion factor of 770 lbs., determines the number of acres required to provide the forage for one animal unit for one month (AUM) within this range subtype.

Animal unit equivalents for the desert mule deer and antelope in this area were calculated based on a method described by Anderson and Denton in a BLM Information Memorandum No. DSC-79-66. For mule deer, this was done as follows:

Throughout their range mule deer consume 3.1 lbs. of forage/100 lbs. of body weight/per day.

According to the New Mexico Department of Game and Fish, the combined average weight in the ES area for males and females is 88 lbs. so:

3.1 lbs./.88 lbs./per day = 2.7 lbs. of forage consumed/deer/day in the ES area.

2.7 lbs./deer/day x 30 days = 81 lbs. of forage/month/deer. Then,

81 lbs. forage = 1 deer unit month

$$\frac{\text{770 lbs/AUM}}{\text{81 lbs./deer UM}} = \text{9.5 Deer UM/AUM}$$

1 AUM = 9.5 deer animal units.

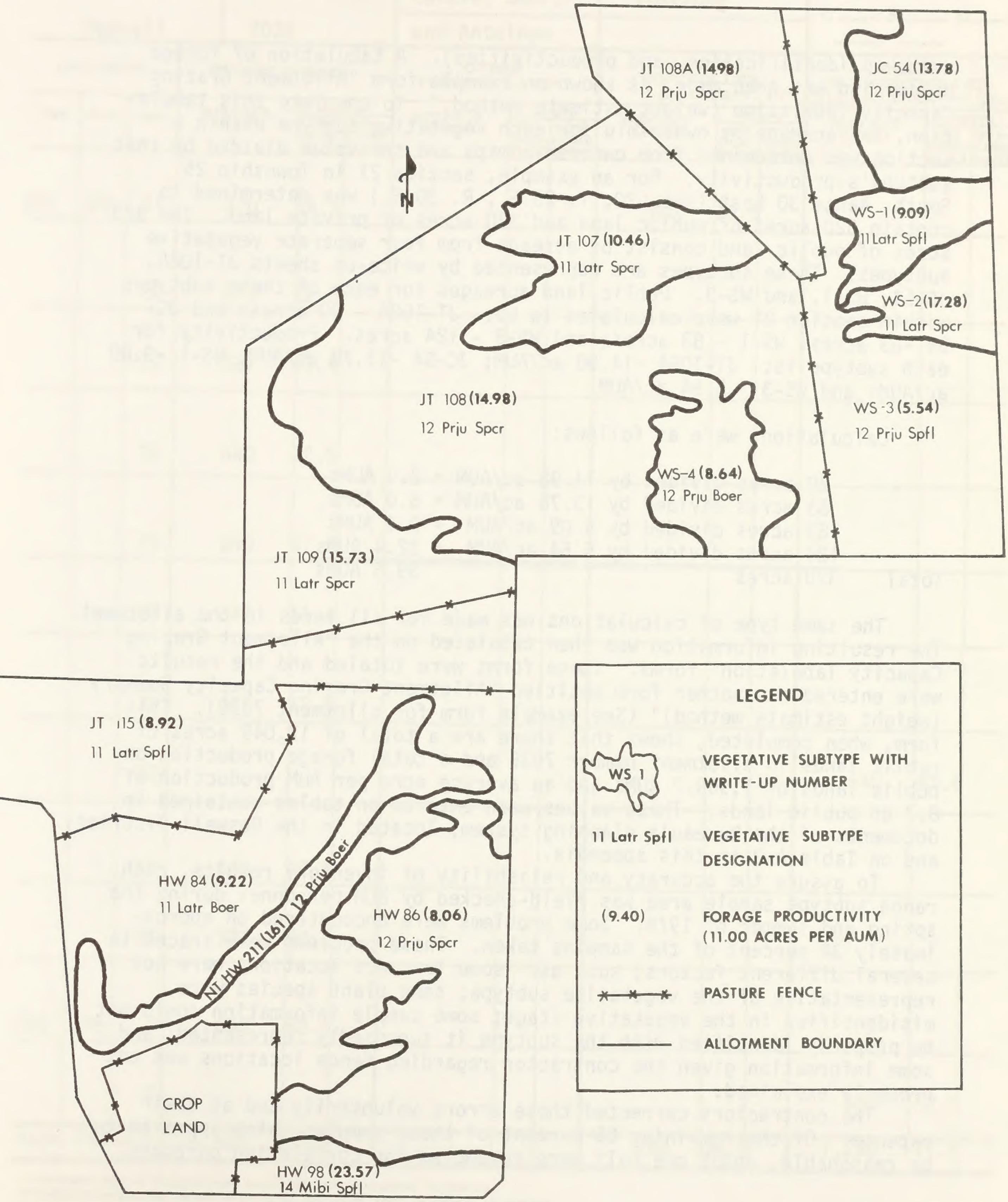
Calculation for antelope are simpler with adult animals consuming an average of 1.8 lbs. of forage per day throughout their range. This converts to 54 lbs. of forage/month/antelope. Then.

$$\frac{\text{770 lbs/AUM}}{\text{54 lbs./Antelope}} = \text{14.5 antelope unit months.}$$

1 AUM = 14.5 antelope unit months.

Based on the sample form, "Forage Survey Type Write-Up (weight estimate method)", these calculations show the productivity for the subtype represented. The forage productivity on this vegetative subtype is 9.09 acres per AUM. There are 13 other subtypes within the allotment area with the productivity of all 13 being determined in the same manner (See Map A-1 for Allotment No. 7039 showing vegetative subtype location,

MAP NO. A-1
RANGE SURVEY VEGETATIVE TYPES
ALLOTMENT NO. 7039



write-up identification, and productivities). A tabulation of forage production was then made, as shown on example form "Allotment Grazing Capacity Tabulation (weight estimate method." To complete this tabulation, the acreage by ownership for each vegetative subtype within a section was determined from ownership maps and the value divided by that subtype's productivity. For an example, section 21 in Township 25 South, Range 30 East (sec. 20, T. 25 S., R. 30 E.) was determined to contain 320 acres of public land and 320 acres of private land. The 320 acres of public land consist of acreage from four separate vegetative subtypes. These subtypes are represented by write-up sheets JT-108A, JC-54, WS-1, and WS-3. Public land acreages for each of these subtypes within section 21 were calculated to be: JT-108A - 30 acres; and JC-54 -83 acres; WS-1 - 83 acres; and WS-3 - 124 acres. Productivity for each subtype is: JT-108A -14.98 ac/AUM; JC-54 -13.78 ac/AUM; WS-1 -9.09 ac/AUM; and WS-3 - 5.54 ac/AUM.

Calculations were as follows:

30 acres divided by 14.98 ac/AUM = 2.0 AUMs
83 acres divided by 13.78 ac/AUM = 6.0 AUMs
83 acres divided by 9.09 ac/AUM = 9.1 AUMs
124 acres divided by 5.54 ac/AUM = 22.4 AUMs
Total 320 acres 39.5 AUMs

The same type of calculations was made for all lands in the allotment. The resulting information was then tabulated on the "Allotment Grazing Capacity Tabulation" forms. These forms were totaled and the results were entered on another form entitled "Allotment Grazing Capacity Summary (weight estimate method)" (See example form for allotment 7039). This form, when completed, shows that there are a total of 17,049 acres of public lands in allotment number 7039 and a total forage production on public lands of 1,969.7 AUMs and an average acre per AUM production of 8.7 on public lands. These values were entered on tables contained in documents of the Bureau's planning system, located in the Roswell District, and on Table A-3 in this appendix.

To assure the accuracy and reliability of inventory results, each range subtype sample area was field-checked by BLM personnel during the spring and summer of 1978. Some problems were encountered on approximately 34 percent of the samples taken. These problems were traced to several different factors, such as: some transect locations were not representative of the vegetative subtype; some plant species were misidentified in the vegetative stage; some sample information could not be properly identified with the subtype it supposedly represented; and some information given the contractor regarding fence locations was not properly explained.

The contractors corrected those errors voluntarily and at their expense. Of the remaining 66 percent of those samples which appeared to be reasonable, about one half were resampled for correlation purposes.

Form 4412-5
(March 1966)
(formerly 4-1707)

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ALLOTMENT GRAZING CAPACITY TABULATION
(WEIGHT ESTIMATE METHOD)

Page 1 of 4 pages

Compiled by J. N.

Date 7-19-78

District: Roswell

Allotment: 7039

KIND OF ANIMAL: Cattle, Deer, and Antelope

SEASON OF USE: Yearlong

Ratios of Livestock and Major Game AUM Use: C ___: S ___: D ___: ___: ___

LOCATION			PUBLIC DOMAIN			OTHER FEDERAL LAND*			RANGE CONTROLLED BY USER** (Private)			RANGE NOT CONTROLLED BY USER*** (State)		
			SURFACE ACRES	AUM's		SURFACE ACRES	AUM's		SURFACE ACRES	AUM's		SURFACE ACRES	AUM's	
TWP.	RGE.	SEC.		USE COMPLEX	NON-COMP GAME		USE COMPLEX	NON-COMP GAME		USE COMPLEX	NON-COMP GAME		USE COMPLEX	NON-COMP GAME
25S	30E	21	320	39.5					320	36.9				
		22	273	22.3										
		27	327	41.4										
		28	640	92.5										
		29	640	47.7										
		30	642	51.4										
		31	641	43.5										
		32										640	65.6	
		33	640	97.0										
		34	382	69.0										
26S	29E	1	640	58.5										
		2										640	52.0	
PAGE TOTALS			4,505	562.8					320	36.9		1,280	117.6	

*Indicate type of Federal land and legal user (allottee) in listing.
**Indicate ownership (State or private) and legal user (allottee) in listing.
***Indicate ownership (State or private) in listing.

☆GPO-1977-779-065-320

Form 4412-6
(March 1966)
(formerly 4-1708)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

ALLOTMENT GRAZING CAPACITY SUMMARY
(WEIGHT ESTIMATE METHOD)

Compiled by J.N.

Date 7-19-78

District	Allotment	KIND OF ANIMAL	SEASON OF USE	Ratios of Livestock and Major Game AUM Use:
Roswell	7039	Cattle, Deer	Yearlong	C ___ : S ___ : D ___ :
		Antelope		___ : ___

RANGE CONTROL	TYPE OF FED. LAND OR OWNERSHIP	LEGAL USER (Allottee)	SURFACE ACRES	GRAZING CAPACITY AUM's USE COMPLEX	GRAZING CAPACITY AUM's NONCOMP. GAME	GRAZING CAPACITY Ac/AUM USE COMPLEX	GRAZING CAPACITY Ac/AUM NONCOMP. GAME
Public Domain			17,048.88	1,969.7		8.7	
Other Federal Land							
SUBTOTALS			17,048.88	1,969.7		8.7	
Controlled by User	Private		1,111	38.2			
	State		2,840	266.8			
SUBTOTALS			3,951	305.0		13.0	
Not Controlled by User							
SUBTOTALS							
ALLOT. TOTALS			20,999.88	2,274.7		9.2	

GPO 857-302

Results obtained through this resampling indicated that production values obtained during 1977 were comparable with production values obtained during 1978. Where variations occurred between the samples taken in each of the two years, the value reflecting the higher forage production level was used for stocking-rate calculations. These variations were relatively minor.

Methodology Used For Predicting Future Forage Production

Based on observations made in the ES area by SCS and BLM personnel, forage production would approximate the potential for each range site (SCS estimate). To do so would require implementation of grazing management programs and control of competing brush species. If these actions are not taken, the production potential will not be achieved, therefore, an increase in forage production is anticipated only on those grasslands and other areas where vegetative treatments have been proposed.

Production potentials for vegetative range sites have been developed by the Soil Conservation Service (SCS), using comparison areas where forage production could be measured. Vegetative range sites are based on various soil mapping units. Identification of the vegetative range sites for this ES area was based on SCS soil surveys which were completed for each of the three county areas involved: the eastern portion of Chaves, the eastern portion of Eddy, and Lea.

Potential forage production estimates for this area are not based on aspect vegetative subtypes, but rather on the vegetative range sites which are tied to the Soils information.

On nongrassland areas where brush control practices are not being proposed, forage production increases are not anticipated. This is based on studies conducted at the Jornada Experimental Range which indicated that, even with total livestock exclusion, mesquite would continue to crowd out good stands of black grama grass. The Jornada study appears to apply to this area because of similar climate, soils, and vegetative types. Other research has also shown that, once mesquite is present on an area, it would continue to increase even if all livestock and rodent use were eliminated (Brown, 1950; Paulsen, 1950; Glendening, 1952).

Specific grazing systems designed to meet forage plant physiological needs are expected to reduce the rate at which mesquite would increase or reinvade. These grazing systems would maintain the existing forage production, but would not be expected to provide for any appreciable increases. Production is expected to improve on those grassland areas that are producing at a reduced level. The level of improvement anticipated should approach potentials for vegetative range sites by the year 2000.

To determine the future production (by the year 2000) on a specific allotment, the proposed treatment area was compared to the vegetative range site information and the anticipated future forage production on that area was calculated (see Table A-8 for future production by range site by allotment). The grassland area was compared to the vegetative range site information and the anticipated future forage production was calculated. Forage production was not projected to increase on the brush-invaded rangelands which are not proposed for treatment. The total of these three values then becomes the anticipated future production of the allotment.

Following this calculation procedure on the allotment chosen as an example (Allotment 7039), the first observation is that there are no grasslands in the allotment which would improve under livestock grazing treatments alone. The public land range sites, total public land acres by range site, public land acres to be treated by range site and resulting AUMs, public land acres to remain untreated with resulting AUMs, and the total anticipated future AUMs production on public lands, based on the vegetative treatments and livestock management are shown on Table M-1:

The values for each column of the table as it relates to public lands was obtained as follows:

Column (1) - District records contain information concerning each allotment, filed by the allotment's number.

Column (2) - Eddy County Soil Survey to information relating to allotment 7039 results in identification of range sites involved.

Column (3) - Calculation of acreages for each range site, using the map for the soil survey information for allotment 7039, yields this result.

Column (4) - Calculation is based on field observations of brush-infested areas, opportunities for treatment and results of the Bureau planning system. The resulting area was compared to information from the soils survey of range sites in the ES area in order to determine the acres to be treated, by range site.

Column (5) - The resulting production was determined by multiplying the productivity of the range site in excellent condition by the number of acres of that range site which are proposed for treatment. (BLM anticipates that "excellent condition" can be achieved on these areas, as demonstrated by treatments carried out in the ES area during the 1960's.)

Column (6) - Information in this column is simply the remaining acreage that would not be treated on the allotment in each range site.

Column (7) - To obtain information in this column, the total present forage production on acres not proposed for treatment on allotment 7039 was calculated from the 1978-1979 forage survey results and an average acre-per-AUM productivity figure was calculated for those range sites which have a potential for producing forage. (Hills and Breaks range site does not now and would not be expected to produce forage) Example:

Total present production on areas not proposed for treatment:
360 AUMs

Total acres producing forage which are not proposed for treatment:
2,516 acres

TABLE M-1
FUTURE FORAGE PRODUCTION ON EXAMPLE ALLOTMENT 7039

Source: Eddy County Soil Survey, Roswell District Files.

			Brush Control		No Brush Control		
Allotment No. (1)	Range Sites (2)	Total Public Land Acres (3)	Treated Public Land Acres (4)	Resulting AUMs (5)	Public Land Acres (6)	Resulting AUMs (7)	Total Future Production on Public Land AUMs (8)
7039		17,049	14,083	4,532	2,966	360	4,892
	(MLRA SD-3)*						
	Deep Sand	9,003	8,492	2,830	511	74	2,904
	Sandy	3,444	3,444	1,148	0	0	1,148
	Bottomland	52	52	26	0	0	26
	Loamy	175	175	43	0	0	43
	Sand Hills	66	66	22	0	0	22
	Gravelly	3,819	1,354	463	1,965	286	749
	Hills and Breaks	490	0	0	490	0	0

*MLRA - Major Land Resource Area designation for use with the Soil Survey.

Note: Although this allotment is not proposed to have vegetative treatments performed during the initial time period (first 8 years), treatment is anticipated within the 20-year time frame of the proposed action. This allotment does not contain any grassland areas.

2,476 acres (2,516 acres minus 40 acres included in exclosures) divided by 360 AUMs = 6.88 acres/AUM.

This average acre-per-AUM figure was then divided into the total acres of each range site that was not proposed for treatment, i.e.,

511 divided by 6.88 = 74 AUMs

1,965 divided by 6.88 = 286 AUMs

Column (8) - This value is established by simply totaling the AUM production anticipated on the treated area with the production of AUMs which would be anticipated on the untreated area, for a total future production which could be anticipated. This same methodology was used to develop Table A-8 in Appendix 1.

In summary, 14,083 acres of the total 17,049 public land acres on allotment 7039 would be treated, resulting in 4,532 AUMs of forage being produced on the treated acreage. The 2,966 acres of public land which would not be treated, are expected to continue producing at the present level of 360 AUMs. The total resulting forage production on allotment 7039 would then be 4,892 AUMs of forage, an increase of 2,922 AUMs over the present production of 1,970 AUMs.

Range Suitability for Livestock Grazing

Although more than 99 percent of the public lands in the ES area are suitable and usable by big game, some are not suitable or properly usable by livestock. To give credit to livestock for the forage production on these unsuitable areas would result in overgrazing of the more suitable areas or would cause further damage to areas which are highly susceptible to wind erosion.

Range suitability criteria were developed by personnel from the BLM's Service Center, using literature citations as a basis for the initial criteria. These criteria were further modified based on actual field applications. Flexibility was developed for use in the Roswell District after obtaining Service Center concurrence. (See the Table M-2, M-3 and M-4 for specific criteria used.)

For a range area to be suitable for livestock grazing, established criteria required that the area must be within four miles of water, that forage production must exceed 32 acres per AUM, slope percentage must be below 50 percent, and soil surface factor (SSF--an erosion rating) below 60, with the exception of areas having forage production higher than 64 pounds per acre (12 acres per AUM). In this latter case, a SSF less than 66 is required. Areas which do not meet these criteria at present, but which would do so following application of the proposed action are classified as potentially suitable for livestock grazing and would become suitable when all the factors have been met. Determination of

TABLE M-2
RANGE SUITABILITY STANDARDS FOR BLM
(Source: BLM Instruction Memoranda)

SUITABILITY ELEMENT	ALLOWABLE VARIATION			All Range Classes Suitability	Exceptions for Ephemeral and Perennial Emphemeral Ranges
	Low	Recommended	High		
1. Percent slope is greater than		50%		U	
1. Percent slope is less than		50%			
2. Current production of usable perennial forage is not sufficient to provide grazing capacity of less than		32 Ac/AUM			
3. Potential production (either through management or treatment) of usable perennial forage is not sufficient to provide grazing capacity of less than.		32 Ac/AUM		U	May be classed as having "Limited Suitability" if all other suitability criteria are met. Go through key from number 4.
3. Potential production (either through management or treatment) of usable perennial forage is sufficient to provide grazing capacity of less than		32 Ac/AUM			
4. Present SSF is greater than.		60 SSF			
5. Potential SSF is greater than. . . .		60 SSF		U (erosion)	
5. Potential SSF is less than		60 SSF			
6. Potential SSF is more than . . .		40 SSF			
7. Slope greater than		20%		U (erosion)	
7. Slope less than.		20%		PS (erosion)	
6. Potential SSF is less than . . .		40 SSF		To Table 1 (erosion)	
4. Present SSF is less than		60 SSF			
8. Present SSF more than (less than 60)		40 SSF			
9. Potential SSF more than (less than 60).		40 SSF			
10. Slope greater than		20%		U (erosion)	
10. Slope less than		20%		PS (erosion)	
9. Potential SSF more than (less than 60).		40 SSF		To Table 1 (erosion)	
8. Present SSF less than		40 SSF		To Table 1 (low Prod)	Limited Suitability
2. Current production of usable perennial forage is sufficient to provide grazing capacity of less than		32 Ac/AUM			
11. Present SSF is greater than.		60 SSF			
12. Potential SSF is greater than.		60 SSF		U (erosion)	
12. Potential SSF is less than		60 SSF			
13. Potential SSF is more than		40 SSF			
14. Slope greater than		20%		U (erosion)	
14. Slope less than		20%		PS (erosion)	
13. Potential SSF less than.		40 SSF		To Table 1 (erosion)	
11. Present SSF is less than		60 SSF			
15. Present SSF more than (less than 60) . .		40 SSF			
16. Potential SSF more than.		40 SSF			
17. Slope greater than		20%		U	
17. Slope less than.		20%		PS (erosion)	
16. Potential SSF less than.		40 SSF		To table 1 (erosion)	
15. Present SSF less than		40 SSF			
18. Distance from reliable water is more than		4 miles		To Table 1 (water)	
18. Distance from reliable water is less than		4 miles		To Table 2	

TABLE M-3
SUITABILITY DETERMINATIONS
(Source: BLM Instruction Memoranda)

Slope Percent	Distance Up Slope	Potentially Suitable	Unsuitable
0%-20%	to 4 miles	X	
21%-30%	to 0.6 miles	X	
	over 0.6 miles		X
31%-40%	to 0.4 miles	X	
	over 0.4 miles		X
41%-50%	to 0.3 miles	X	
	over 0.3 miles		X
51%			X

TABLE M-4
SUITABILITY DETERMINATIONS
(Source: BLM Instruction Memoranda)

Slope Percent	Distance Up Slope	Suitable	Unsuitable
0%-20%	to 4 miles	X	
21%-30%	to 0.6 miles	X	
	over 0.6 miles		X
31%-40%	to 0.4 miles	X	
	over 0.4 miles		X
41%-50%	to 0.3 miles	X	
	over 0.3 miles		X
51%			X

these criteria were based on literature searches performed by the Bureau of Land Management (see citations on file in the Roswell District Office, and Washington Office Instruction Memorandum Number 78-590). Flexibility applied in the East Roswell ES Area consisted of allowing the SSF to increase from 60 to 66, if corresponding forage production was higher than 64 pounds per acre (12 acres per AUM). Rationale used to make this deviation is that SSFs, as applied in the ES area, often are the effects of small wind-erosion areas attributable to unstable soil conditions in the watershed transect areas. These unstable areas project a high SSF value over the entire transect area but stable soils with good ground cover do exist, intermixed but separate from the areas of unstable soils. Reductions in grazing use would not improve the situation on the unstable soil areas and continuation of grazing under proper use would not cause increased erosion on those areas with a ground cover which produces forage in excess of 64 pounds per acre (12 acres per AUM).

These range suitability criteria were then applied to the forage survey results to determine the total forage production on the public lands which are suitable for livestock grazing. They were also applied to the predicted forage production values to determine the total future forage that would be suitable for livestock grazing on public lands. The results were entered on Table A-3.

Using allotment 7039 as the example, range suitability criteria were applied to the allotment. There are no subtypes with a productivity level requiring more than 32 acres to produce an AUM of forage. No area is greater than four miles from water and no area has a general slope percentage in excess of 50 percent. However, there are areas which do have soil surface factors (SSFs) which exceeded 60. Four areas have SSFs in excess of 66 and are, therefore, presently unsuitable for livestock grazing. Three areas have SSFs in excess of 60 but less than 66 and their productivity levels require more than 12 acres to produce one AUM. Therefore, under established criteria, these seven areas fall into a presently unsuitable classification. The forage being produced on these seven areas, involving 4,414 acres of public land, is calculated to be 496 AUMs leaving 1,474 of the total 1,970 AUMs as being suitable for livestock. AUMs produced on acreage which is unsuitable for livestock grazing would be available for other uses, such as game animals, and watershed protection.

The same suitability criteria were used to predict the future production of forage. After applying these criteria to sample allotment 7039, it was found that long-run forage production increases and improvements in SSF values would result in 490 acres remaining unsuitable for livestock grazing. The forage produced on these acres was calculated to be "0" AUMs, leaving the total of 4,783 AUMs predicted for future production as suitable for livestock grazing.

Proper Range Utilization Level

The proper range use for this area is based primarily on the physiological requirements of the most palatable forage plants (those with a PUF of 45 to 55 percent). This use falls within the "moderate use" (40 - 60 percent) class for range utilization. The achievement of a specific percentage of forage plant use is not practical, however, management to achieve a use level within a specific utilization class would be. With the upper limit of the moderate use class being designated as 60 percent, and that limit being defined as the approximate point where 50 percent of the growth stops for grass roots (relatively safe level to maintain plant vigor as only approximately 30 percent of the roots need to be replaced), (Dietz 1975) there is little danger that damage to forage plants would occur as long as the forage use is within that class.

The moderate use class is described as follows:

> "Fifteen to 25 percent of the number of the current year's seed stalks of key species remain intact. No more than 10 percent of the number of low-value forage plants has been utilized, but the range appears to have been entirely covered as uniformly as natural features and facilities will allow."

Under this range use level, vegetation which has not been consumed by grazing animals (a minimum of 40 percent of the current year's forage plant production on even the most palatable species, and up to 100 percent of the vegetative production on the nonforage plant species) would be left for nonconsumptive uses such as wildlife cover, soil protection, and scenic values.

DETERMINATION OF BIG GAME POPULATIONS (Procedures)

Population estimates for big game are based on information provided by the New Mexico Department of Game and Fish.

Existing Big Game Populations

Deer and antelope density estimates (number of animals per unit of area) along with maps indicating habitat areas within this ES area were provided by the New Mexico Department of Game and Fish. Using these density estimates, numbers of deer and antelope which would exist in each allotment were calculated. It is recognized that the exact figure may be different but with fluctuating populations, the numbers are believed to be reasonable. The total allotment population was prorated based on the percentage of public lands within the allotment having deer or antelope habitat.

The calculations on allotment 7039 (used as an example) resulted in a determination that seventeen deer and seven antelope presently occupy habitat in the allotment. Eighty-one percent of the land in allotment 7039 is public land. Since seventeen deer live on allotment 7039, 81 percent of seventeen deer equals fourteen deer occupying public lands, and 81 percent of seven antelope equals six antelope occupying public lands.

Predicted Future Big Game Populations

Potential population densities were estimated for the existing and potential habitats in the ES area, using information obtained from the Planning Area Analysis concerning future demands, New Mexico Department of Game and Fish long-range plans, and the Bureau's planning system results based on habitat potentials and multiple use considerations. Using these density estimates, the number of deer and antelope anticipated by the year 2000 was calculated for each allotment. These numbers were prorated, based on the percentage of public lands having potential habitat in each allotment.

For sample allotment 7039, BLM resource specialists determined that 23 deer and 71 antelope would be located on the allotment by the year 2000. Prorating this projection, based on 81 percent of the allotment's land being public land, results in an estimation that 19 deer and 6 antelope would be occupying the allotment by the year 2000.

FORAGE ALLOCATION BETWEEN LIVESTOCK AND BIG GAME

The Bureau planning system for this ES area allocates the forage production between livestock and big game. The procedure used to determine the amount for each use is as follows:

Allocation of present forage production: the planning system's proposal is to provide enough forage on public lands to meet the present big game population requirements on public land habitats (estimated populations are 1,462 deer and 1,159 antelope on public lands in the ES area). Forage remaining which is properly usable by grazing animals would be allocated for livestock. Vegetation, other than the properly usable forage, would remain on the area to provide cover requirements of other wildlife species as well as to provide protection to the soils from erosional forces.

The procedure used to allocate forage on each allotment was to obtain the deer and antelope population numbers prorated to the public lands within each allotment. These population numbers would be converted to a forage requirement by using the animal equivalents (9.5 deer = 1 AUM and 14.5 antelope = 1 AUM) and subtracting the resultant value from the allotment's total forage production, without regard to livestock suitability criteria. BLM specialists made the assumption that big game use is equally distributed throughout the habitat area within each allotment.

Forage remaining on those areas which have been determined to be suitable for and available to livestock for grazing was then determined (areas to be excluded from livestock grazing would not be considered). Forage production remaining would then be allocated to livestock.

Using allotment 7039 as the example, there are fourteen deer and six antelope occupying habitat on public lands. This converts into a forage requirement of 1.5 AUMs of forage for deer and .4 AUMs of forage for antelope each month. This would be a total requirement of 1.9 AUMs of forage each month or 23 AUMs of forage for the entire year. These 23 AUMs would be provided uniformly over the public lands in the allotment. Seventy-four percent of the allotment is suitable and available for livestock grazing, therefore, 17 AUMs of forage would be allocated for deer and antelope from that area (the remaining 26 percent of the area consists of 40 acres of exclosures to protect wildlife habitat and 4,419 acres unsuitable for livestock grazing due to erosion). Based on the 1977-78 range survey, the total forage production on the area which is suitable for livestock grazing is 1,449 AUMs. The allocation to big game would be 17 AUMs and the allocation to livestock would be 1,432 AUMs (forage production on the area which is either unsuitable and unavailable for livestock grazing is 521 AUMs, of which six AUMs would be allocated to big game. The remaining 515 AUMs of residual production would be left unused, along with the nonforage vegetative cover and ground cover which is not properly usable. This would be set aside for watershed protection.)

Allocation of future forage production: the planning system's proposal is to provide forage on public lands to meet requirements of the big game population on public land habitats at all times. This requires an allocation which is flexible. To achieve this flexibility, the allocation would be based on actual utilization of forage by both big game and livestock.

BLM resource specialists have assumed that, at the moderate (proper) use level (40 - 60 percent utilization), competition between livestock and big game would not be a factor in limiting big game population growth.

As utilization drops below the moderate level, stocking rates for livestock would be increased until the moderate level of use again occurred. If utilization exceeds the moderate level, the stocking rate for livestock would decrease until the proper use levels are reached. These adjustments would be gradual and would reflect overall trends rather than year-to-year fluctuations in forage production.

An estimation for the allocation of future forage production is based on the assumption that big game populations will increase in number. This increased number, along with the present population, would require an additional amount of forage from the ES area's public lands.

The procedure used to estimate the future allocation of forage for big game on each allotment was based on a determination of the big game populations anticipated on each allotment. Consideration was given to reducing competition for forage, stabilizing herd movements through the addition of proposed watering sites, and the expansion of herds into areas previously unused or lightly used, due to additional watering facilities. An assumption was made by BLM specialists that limiting factors unrelated to livestock grazing activities would not change. The anticipated deer and antelope numbers were prorated, based on the percentage of public lands in each allotment, and the forage requirement was calculated, again using the animal unit equivalents (9.5 deer = 1 AUM and 14.5 antelope = 1 AUM). The resultant forage requirement was then subtracted from the total anticipated future forage production of each allotment. Again, this would be without regard to suitability for livestock grazing or livestock exclosures and with the assumption being made that big game would be equally distributed throughout the habitat area within each allotment.

Forage remaining on the areas suitable and available for livestock grazing would then become the amount allocated for livestock grazing use.

Again using allotment 7039 as the example, nineteen deer and six antelope are anticipated to occupy the habitat area on public lands by the year 2000. This converts to 2.0 AUMs of forage required for deer and .4 AUMs of forage required for antelope each month for a total of 2.4 AUMs for big game each month or 29 AUMs of forage each year. These AUMs of forage would be provided uniformly over the public lands in the allotment.

BLM resource specialists anticipate that, through vegetative treatments, livestock facilities, and proper grazing management, the acreage of rangelands suitable and available for livestock grazing will increase to 16,559 acres or 97 percent suitable. Ninety-seven percent of 29 AUMs required by big game equals 28 AUMs that would be allocated for big game on the area which is suitable for livestock grazing (the remaining 3 percent of the area consists of 490 acres of range site that does not have a production potential and 40 acres with a production potential of 25 AUMs but which would be excluded from livestock to provide for wildlife habitat values).

The total forage production anticipated on the area and which is anticipated to be suitable and available for livestock grazing is 4,735 AUMs. The allocation to big game is anticipated to be 28 AUMs and the allocation to livestock is anticipated to be 4,707 AUMs.

Summarization of Methodology for Forage Production and Allocation

In summarizing this methodology using allotment 7039 as an example, it has been demonstrated that on public lands:

Existing forage production is 1,970 (1977-78 inventory).

Anticipated future forage production is 4,760 (range site potentials on brush treatment areas and existing production on untreated areas).

Area presently suitable for livestock grazing - 12,635 acres (range suitability criteria).

Present forage production on suitable area - 1,475 AUMS (1977-78 inventory).

Area presently unsuitable for livestock grazing - 4,414 acres (range suitability criteria)

Present forage production on unsuitable area - 496 AUMs (1977-78 inventory).

Area anticipated to be suitable for livestock by the year 2000 - 16,559 ac. (range suitability criteria).

Anticipated forage production on suitable areas by the year 2000 - 4,783 AUMs (range site potentials).

Area anticipated to be unsuitable for livestock by the year 2000 - 490 ac. (range suitability criteria).

Anticipated forage production on unsuitable areas by the year 2000 - 0 AUMs (1977-78 inventory).

Initial forage allocation for big game - 23 AUMs (present population densities.

Anticipated future forage allocation for big game by the year 2000 - 28 AUMs (anticipated population densities).

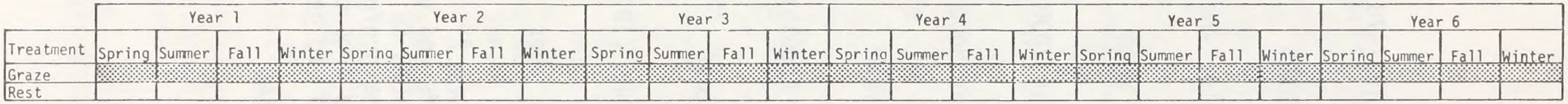
Initial forage allocation for livestock grazing - 1,432 AUMs (1977-78 inventory).

Anticipated forage allocation for livestock grazing by the year 2000 - 4,707 AUMs (range site potentials).

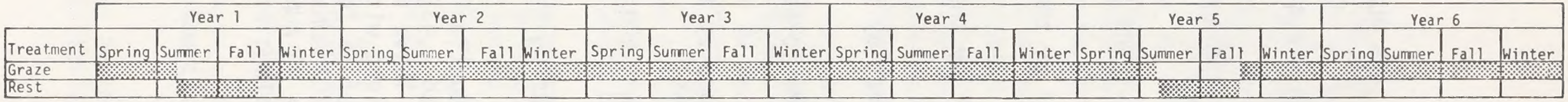
This indicates that, of the present forage production (1,969.7 AUMs) on allotment 7039, livestock would be allocated 1,432 AUMs and big game would be allocated 23 AUMs. These allocations leave 514 AUMs on areas which are unsuitable for livestock grazing, along with the nonforage vegetation, for ground cover. Of the anticipated future forage production of 4,783 AUMs, livestock would be allocated 4,707 AUMs and big game would be allocated 28 AUMs. These allocations leave 25 AUMs on the areas which are unavailable for livestock grazing, along with the nonforage vegetation, for ground cover.

SCHEMATIC 1
GRAZING TREATMENTS TO BE USED IN THE ES AREA
(Source: District Files, SCS Range Site Information,

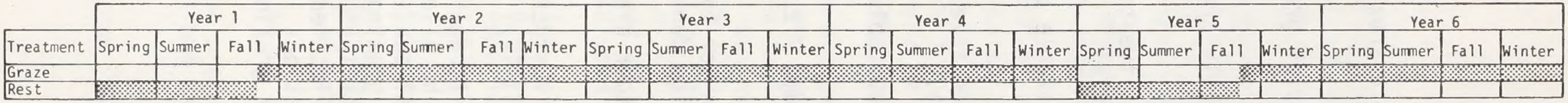
Continuous Yearlong Grazing Treatment



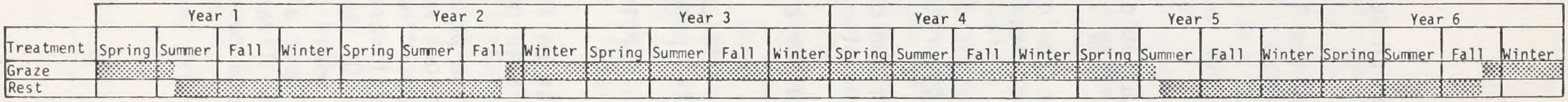
Four Month Minimum Rest Grazing Treatment (July - October) Once Every Four Years



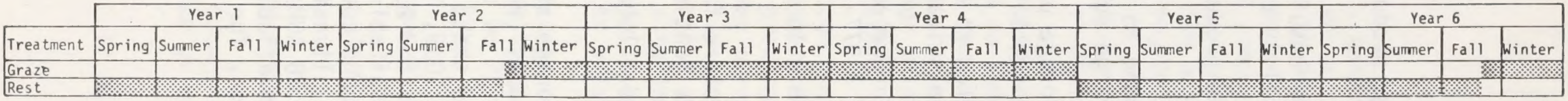
Eight Month Rest Grazing Treatment (March - October) Once Every Four Years



Sixteen Month Rest Grazing Treatment (July - October) Once Every Four Years



Twenty Month Rest Grazing Treatment (March - October) Once Every Four Years



Two Year Rest Grazing Treatment (March - February) Once Every Four Years

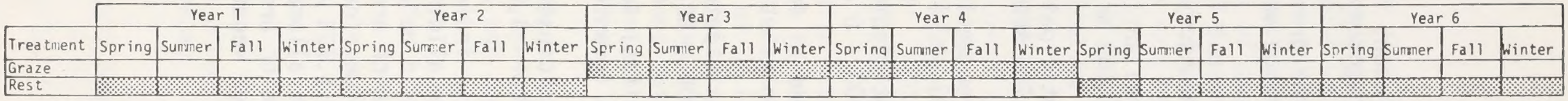


TABLE A - 1
PLANNING SYSTEM INTERRELATIONSHIPS
(Source: Roswell District MFP for East Chaves, East Eddy, and Lea Counties)

LIVESTOCK MFP 1	OTHER RESOURCE STEP 1 INTERRELATIONSHIPS	MFP STEP 1 CONFLICTS (OR BENEFITS)	MFP PROPOSED DECISION	RESOURCE TRADEOFF
EE/L RM-1.1, 1.3 EC RM-1.1, 1.10, 2.1, 2.5 Continue with the classification of yearlong range for cattle, sheep, goats or horses.			RM-1.1, 2.1, 2.5 Allow yearlong use to continue, with the understanding that it is suitable for use during any season and not necessarily continuous yearlong use.	None.
	EE/L WL-1.5 Rest 50% of the shortgrass annually in spring months to assure undisturbed nesting for plovers and curlews.	Seed heads, seed crops, etc., can only be formed in the summer and early fall. They can be best utilized during the late fall and winter. This would restrict the grazing to spring use only.	WL-1.5 This activity recommendation was rejected.	Grazing systems are expected to provide sufficient undisturbed nesting for plovers and curlews.
	EE/L WL-1.15, 5.9, & 1.6 Reserve 80-88% of annual seed head production of certain species in shinnery oak and shortgrass.	Seed heads, seed crops etc. can only be formed in the summer and early fall. They can be best utilized during the late fall and winter. This restricts the grazing to spring and early summer use only.	WL-1.15, 1.16, & 5.9 This activity recommendation was rejected.	Grazing systems are expected to provide seed far in excess of that provided at present. This would be sufficient for the wintering birds' use.
	EC WL-7.5 To stabilize the habitats of the Baird's sparrow and McCown's Longspur, make the development of a mosaic pattern of grasslands with a standing crop of seed a requirement of allotment management plans.	Seed heads, seed crops, etc., can only be formed in the summer and early fall. They can be best utilized during the late fall and winter. This restricts the grazing of certain areas to spring use only.	WL-7.5 Consideration will be given to providing the amount of grass seed on a specific locality for wintering Baird's Sparrow and McCown's Longspur. This consideration will be applied on certain allotments only.	This consideration would probably be given only if the birds have no alternative food supplies. In actuality, grazing systems meeting plant physiological requirements would probably supply the seed.
	EC WL-4.1 Allotments supporting high yield forb production areas should have rest periods from livestock grazing during the spring and early summer.	Almost half the year's livestock use would be excluded on the high yield forb producing areas.	WL-4.1 This activity recommendation was accepted in part. High yield forb producing areas will be rested on a rotational basis.	This would impact livestock somewhat, however, rest required to meet plant physiological requirements would provide much of this desired rest resulting in only a minor impact.
	EC WL-7.12 To enhance the nesting success of the Long-eared Owl, Pigeon Hawk, Scissor-tailed Flycatcher, White-throated Sparrow, and all ground nesting birds, exclude livestock grazing from March 1 to August 1 of each year.	Almost half the year's livestock use would be excluded.	WL-7.12 Selected sites will be fenced and excluded from livestock grazing during the March to August period within habitat areas for the enhancement of nesting habitat for protected bird species. Emphasis will be placed to select only the key nesting sites.	This would impact livestock somewhat, however, livestock can utilize this forage following the nesting season so the impact is relatively minor.

Key:

MFP = Management Framework Plan
EE/L = East Eddy-Lea Planning Unit Recommendation
EC = East Chaves Planning Unit Recommendation
WL = Wildlife Recommendation
RM = Range Management Recommendation
R = Recreation

TABLE A - 1
PLANNING SYSTEM INTERRELATIONSHIPS

LIVESTOCK MFP 1	OTHER RESOURCE STEP 1 INTERRELATIONSHIPS	MFP STEP 1 CONFLICTS (OR BENEFITS)	MFP PROPOSED DECISION	RESOURCE TRADEOFF
	EE/L WL-1.28			
	Expand habitat for listed classified species by conducting experimental plantings of cottonwood and other species at dirt tanks within 10 miles of the Pecos River.	Natural reproduction and plantings would require exclusion of livestock.	This activity recommendation was accepted.	This excludes grazing while trees and brush are growing, but it would also provide shade when trees grow too tall for livestock to damage. The area involved is minor.
	EE/L WL-1.34		WL-1.34	
	Expand habitat for Marsh hawk, Harris' hawk, ferruginous hawk, song sparrow by erecting 2-acre exclosures above dirt tanks which include a portion of the tank.	Natural reproduction and plantings would require exclusion of livestock.	This activity recommendation was accepted. These exclosures shall be constructed on a limited number of identified localities with the consent of the allottee. Exclosure results shall be monitored closely to determine if a more intensive exclosure program is warranted.	This would exclude grazing while trees and brush are growing, but it would also provide shade when trees grow too tall for livestock to damage. The 2-acre exclosures have relatively insignificant effect on livestock grazing.
	EE/L WL-6.2		WL-6.2	
	Improve conditions for aquatic plant growth by fencing all or part of playas and sinks or overflow areas that have water-holding capabilities.	Livestock may be fenced from water.	Identified ephemeral water holding areas may be fenced to improve aquatic plant growth. Allow livestock access to traditional drinking holes.	Livestock would get water and aquatic animals would receive habitat. No significant tradeoff identified.
			WL-1.17	
			Activity recommendation was rejected. Investigating different size areas was also rejected. (sufficient in E.C.)	
			WL-1.19	
			This activity recommendation was modified to recommend 20-40 acre exclosures on mixed desert shrub.	Data received from these areas could also be useful to range, however, there would be a loss of forage usable by livestock on these areas. Data source might not be large enough to give adequate information.
	EC WL-8.3		WL-8.3	
	Construct exclosures at designated locations to develop a mosaic of optimum quality nesting habitat for Lesser Prairie Chickens within their habitat areas. Exclosures should equal a minimum of 2 square miles contained within no more than 8 square miles; minimum size of 160 acres with a minimum width of 1/2 mile. Management goals for these sites will be a quality shinnery oak grassland with the key species of bluestem and little bluestem comprising 30% or better of the entire vegetative community. Livestock will be excluded from these sites until recovery is complete.	Livestock would be excluded from these areas.	Construct exclosures within specific grazing allotments at locations identified on the overlay to develop a mosaic of quality nesting habitat for existing occupied areas of the Lesser Prairie Chicken. Each exclosure will not exceed 160 acres in size Exclosures may be grazed when and if subtype I habitat conditions are met provided this vegetative condition is assuredly maintained.	

LIVESTOCK MFP 1	OTHER RESOURCE STEP 1 INTERRELATIONSHIPS	MFP STEP 1 CONFLICTS (OR BENEFITS)	MFP PROPOSED DECISION	RESOURCE TRADEOFF
	EE/L WL-2.4 (Area - All identified habitat)		WL-2.4	
	Fence, and exclude from grazing, identified groves of soapberry, hackberry, and other playas and riparian draw trees with at least 5 acre exclosures to furnish resting and bedding sites.	Grazing would be excluded.	This activity recommendation was rejected.	Some resting and bedding sites would not be exclusively available for wildlife, however, areas designated as plantation or nesting sites would provide much of this and would afford an opportunity to experiment with this approach.
	EC WL-9.2, 11.1		WL-9.2, 11.1	
	Continue to develop ground level wildlife water units on all pipeline developments. Include drinking and escape ramps in all present and future livestock waterings.	Livestock would probably be excluded from the ground level water developments and cover developments.	Develop additional waters in the form of reservoirs, springs, and dirt tanks over the entire planning unit and fence areas around existing and future water developments that have a potential for providing wetland habitat and use. Livestock water if needed would also be provided in conjunction with these developments.	Water would be provided for both wildlife and livestock. Fencing would exclude livestock from relatively small areas of range land (2 acres or less).
	EC WL-9.3, 9.1		WL-9.3, 9.1	
	Cover should be developed or areas with approporate cover should be selected for future water developments. If cover in the area of developments is inadequate, plots could be planted to condalia, javelina bush, littleleaf sumac, and/or four winged saltbush.	Livestock would probably be excluded from the ground level water developments and cover developments.	Activity recommendation was accepted.	These areas are normally quite small. Therefore, the effect on livestock is not expected to be significant.
	EC RM-5.1		RM-5.1, 3.1	
	Continue to preserve and protect the Mathers Natural Area.	Livestock would be excluded from these areas	Continue to preserve and protect Mathers Natural Area. Investigate the possibilities of including additional areas beyond the fenced portion that would meet natural area criteria before designation and include the additional area if appropriate in the designation as a Research Natural area.	Data received from these areas could also be useful to range. The area that would be included in addition to that already excluded does not presently receive enough grazing pressure to result in an impact to grazing should it be excluded.
	EC R-3.1			
	Formally designate the area enclosed by the existing fence as a Research Natural Area in accordance with procedures outlined in 43 CFR 2070 and BLM Manual 2070.	Livestock would be excluded from these areas.		

TABLE A - 1
PLANNING SYSTEM INTERRELATIONSHIPS

LIVESTOCK MFP 1	OTHER RESOURCE STEP 1 INTERRELATIONSHIPS	MFP STEP 1 CONFLICTS (OR BENEFITS)	MFP PROPOSED DECISION	RESOURCE TRADEOFF
	EC R-1.4 Close recommendation areas 1 and 2 to livestock grazing, and fence along designated boundaries.	Livestock would be excluded from these areas.	R-1.4 Close the South Dune Area A to livestock grazing and area B when it is designated and protected as an outstanding natural area.	Little forage of value to livestock grows in these areas, and livestock do not presently graze the areas enough to result in any tradeoff should livestock be excluded.
	EE/L WL-2.11, 5.11, 3.12 Reserve all AUMs for deer, prairie chicken, and antelope on Section 15 allotments where public land totals 20% or less of the pasture or allotment. The forage will be made available to animals through fencing to exclude livestock.	Livestock would be excluded from these areas.	WL-2.11, 5.11, 3.12 This activity recommendation was rejected.	Wildlife vegetational needs might not be met on these areas should the operator choose not to graze in a manner on his private and state lands that would be necessary to meet their needs.
	EE/L FP-1.1 Plant approximately 10 acres of cottonwood trees along the Pecos River. Planting should be in the early spring, on cleared ground. Occasional watering will probably be necessary for a few years. The first two areas should be planted by 1980.	Livestock would be excluded on very small acreages as the trees become established.	FP-1.1 This activity recommendation was rejected in favor of WL-1.28.	The acreage involved is so small that it would have virtually no impact on livestock.
EE/L RM-1.7, EC-3.4 Determine the current range capacity and potential for the Planning Unit and adjust livestock numbers to current capacity.			RM-1.1, 3.4 Adjust stocking rates as required to conform to estimated capacity, while providing for present wildlife needs.	Livestock forage would be reduced to provide for wildlife needs.
	EE/L WL-1.4 Provide habitat for a variety of prey species for kit fox, swift fox, ferruginous hawk, dusty hobnosed snake, and bull snake by managing former and crucial shortgrass areas towards grama-dominated potential. Grass cover should average 80% with species dominated by blue, black, or gyp grama.	Benefit - Actually, this is similar to the livestock goals - just for a different purpose. This would require vegetative manipulation to achieve in some instances.	WL-1.4 This activity recommendation was accepted.	None identified.
	EE/L WL-1.14 Improve habitat conditions for the plains harvest mouse and other prey species by resting 50% of shinnery oak area annually on each allotment until grass cover averages 60%. Grass species composition should approach SCS range site potential.	This not a conflict in goal, but a conflict in magnitude. Both resources want the grass cover increased. However, 50% of the area to be rested annually may be in excess to livestock requirements.	WL-1.14 This activity recommendation was rejected in part. Implement Range Management 1.2 and RM 1.4 and Watershed 1.2 and W-2.2 which recommend developing specific grazing systems. These grazing systems should be developed with consideration toward improvement of the plains harvest mouse and other prey species habitat, as well as livestock.	Grazing systems are expected to solve problems through meeting plant physiological requirements. It probably would not require so great an amount of rest as was recommended, however.

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PLANNING SYSTEM INTERRELATIONSHIPS

LIVESTOCK MFP 1	OTHER RESOURCE STEP 1 INTERRELATIONSHIPS	MFP STEP 1 CONFLICTS (OR BENEFITS)	MFP PROPOSED DECISION	RESOURCE TRADEOFF
	EE/L WL-1.15, 1.6, 5.9		WL-1.15, 1.16, 5.9	
	Provide food and habitat in certain communities by reserving plant material as follows. Reserve 80 - 88% of annual seed head production of certain species in shinnery oak and shortgrass.	Benefit - results in range improvement may be more quickly achieved, however, the magnitude of nonuse is very high. Eighty-eight percent of the seed heads being reserved would result in very little forage being available for livestock and wildlife consumtive use.	This activity recommendation was rejected in part. Food and habitat would be provided through constraints to grazing systems, but may not be to the magnitude of 80-88% of all the seed head production over the entire area, but rather a mosaic, with all the seed heads concentrated in some areas.	Grazing systems would be expected to alleviate problems through providing areas of virtually no use through rest and deferment in these plant communities and habitat areas.
	EE/L WL-2.2 (Area - All indentified habitat)		WL-2.2	
	Design a grazing system that will maintain the present density of shinnery oak and increase acorn production by improving vigor through proper rest periods.	Benefit - Vegetative results would be achieved, since the plants would improve in vigor if they are in a state of poor vigor at the present time and proper rest or deferment is not provided.	This activity recommendation was accepted and would be provided for through the implementation of specific grazing systems.	Almost any grazing system which meets the physiological needs of the plants would achieve the desired results.
	EE WL-1.5 EE/L WL-4.3		WL-4.3	
	Maintain the shortgrass aspect on areas noted on the overlay.	Benefit - Vegetative results would be achieved. This is in agreement with livestock objectives.	Accept activity recommendation.	None.
	EE/L RM-1.2, 1.3, EC RM-1.1, 1.10		RM-1.1	
	Revise AMPs and implement specific grazing systems so that a maximum sustained amount of livestock forage will produce. Incorporate a 4-month minimum rest standard during the growing season 1 year out of every 4 into the grazing systems on allotments identified for development of specific grazing systems.	Benefit - Vegetative results would be achieved, range would improve.	Revise certain AMPs to increase as much livestock forage as possible while still meeting the vegetative goals for wildlife habitat. To include a minimum rest standard whereby even the best ranges would receive at least 4 months rest out of every 4 years and ranges in poorer condition would receive more as required to restore plant vigor and meet other multiple use objectives, primarily for wildlife.	None, except goals for wildlife habitat are added, which, may reduce the amount of forage available at certain times of the year.
	EC WL-7.5		WL-7.5	
	To stabilize the habitats of the Baird's sparrow and McCown's Longspur, Make the development of a mosaic pattern of grasslands with a standing crop of seed a requirement of allotment management plans developed in the planning unit.	Benefit - Vegetative results would be achieved. Fits in well with incorporate yearlong rest periods.	Consideration will be given to providing the amount of grass seed on a specific locality for wintering Baird's Sparrow and McCown's Longspur. This consideration will be applied on those allotments identified to have specific grazing systems developed.	Grazing systems would be constrained to achieve this objective.
	EC WL-8.1		WL-8.1	
	Declare the primary consideration and objective of lands within the defined critical areas as the management of the lesser prairie chicken and stop all other activity recommendations (i.e., initiation of AMPs, rights-of-way, etc.) that could have an adverse impact on the	This may or may not be influenced by livestock reductions. It depends on the type of use the prairie chicken makes of certain specific areas. Most of the other probable activities are covered in the oil & gas EAR.	Develop a habitat management plan for the prairie chicken in the unit. This plan is to provide for grazing management techniques, land use restrictions, interpretation opportunities, and land acquisition plans.	HMP should cover, however, HMP will not be approved until after ES. There may or may not be increased restrictions. This may delay development of specific grazing systems and could have a great effect on livestock grazing use.

LIVESTOCK MFP 1	OTHER RESOURCE STEP 1 INTERRELATIONSHIPS	MFP STEP 1 CONFLICTS (OR BENEFITS)	MFP PROPOSED DECISION	RESOURCE TRADEOFF
	EC WL-8.1 (continued) habitat, except those analyzed and stipulated in the oil and gas EAR until a habitat management plan is developed and approved.			
	EC WL-8.2 Manage all prairie chicken habitat to minimum composition of Sand Bluestem 9% and Little Bluestem 12%. On certain soil types, bluestems should be set at 25% along with average height of bluestems by species at 20 inches.	Benefit - Vegetative results would be achieved, livestock utilization on Bluestem under proper use is 25% also. It should not be difficult to achieve these results with livestock grazing.	WL-8.2 Conduct grazing management to obtain as much prairie chicken habitat as possible.	There is an opportunity to continue livestock grazing yet improve range for prairie chickens, and thereby accomodate both activities.
EE/L RM-1.2, 1.4 Construct needed facilities.			RM-1.2, 1.4 Revise certain allotment management plans so as to achieve maximum forage production for all resource values.	Range management tradeoff would be that benefits of facilities would be shared by all resource values
EC RM-3.7 Construct additional livestock management facilities such as fences, water development (pipelines, storage tanks, wells, drinking troughs).			RM 3.7 Construct livestock management facilities as identified on the overlay to facilitate grazing management. The following design features should be applied to the range improvements. 1. All livestock water must facilitate the watering of wildlife. 2. All fences in antelope habitat must provide for as much free access for antelope as possible and still provide for the reasonable control of livestock. 3. Sensitive wildlife habitat areas will be avoided in locating livestock water.	Range management tradeoff is in the form of magnitude. Some facilities were dropped; and meeting the constraint requirements could cause maintenance problems and livestock losses.

A number of recommendations interrelate with livestock facilities. All of them have an extremely minor loss of habitat (much less than 1%) plus an improvement in livestock distribution, which benefits wildlife as well. These recommendations are: EC RM-1.1, EC WL-1.2, 1.3, 2.1, 2.3, 2.4, 2.5, 2.6, 3.1, 4.1, 4.7, 4.8, 6.3, 7.1, 7.3, 7.5, 7.9, 7.13, 8.1, 8.2, 8.3, 9.1, 9.3, 9.4, 9.7, 11.1, 13.1, EE/L WL-1.1, 1.4, 1.5, 1.6, 1.14, 1.15, 1.17, 1.19, 1.23, 1.26, 1.27, 1.28, 2.2, 2.4, 2.5, 2.8, 2.9, 2.10, 1.11, 3.1, 3.2, 3.3, 3.10, 3.11, 3.12, 4.2, 5.1, 5.3, 5.6, 5.7, 5.8, 5.9, 5.11, 6.2, EE/L R-1.1, 3.1, and 3.2.

EE.L RM-1.4 Perform vegetative treatments.			RM-1.4 Vegetative treatments will be applied to those areas that will improve the vegetation complex for watershed, range and wildlife resource values, and not adversely affect other resource values. Certain areas will be controlled only by mechanical means (M), others by chemicals (C), and in other instances both control means will be used (CM).	Tradeoff is in the form of constraints to be applied to the treatment practices and site specific concerns.

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PLANNING SYSTEM INTERRELATIONSHIPS

LIVESTOCK MFP 1	OTHER RESOURCE STEP 1 INTERRELATIONSHIPS	MFP STEP 1 CONFLICTS (OR BENEFITS)	MFP PROPOSED DECISION	RESOURCE TRADEOFF
EC RM-1.3 Conduct mesquite and saltcedar control efforts on identified lands (see overlay). Control areas should be refined and management prescribed during AMP preparation.			RM-1.3 Conduct mesquite concontrol on identified lands with the use of the following guidelines. 1. Use only selective mechanical control in identified mule deer habitat. 2. Use only selective mechanical control in identified lesser prairie chicken habitat where shinnery oak is present. 3. Use only selective mechanical and chemical control in desirable nesting habitat for protected bird species. 4. Provide an adequate amount of untreated mesquite cover to meet optimum quail habitat needs on those sites occupied. 5. No mechanical mesquite control in the Mescalero Sands. 6. No mesquite control will be conducted on selected sites in allotments 5020, 5021, 5024, 5040, and 5057 during the critical nesting period for ground nesting birds. 7. Conduct saltcedar control on identified lands with the use of the following guidelines. Conduct selective mechanical control leaving islands of saltcedar for wildlife nesting habitat.	Tradeoff by range management is in terms of constraints in type of control measures, timing of control and site specific extent.
EC RM-1.11 Conduct creosote and desert shrub control efforts on identified lands.			RM-1.11 Creosote Control Conduct creosote control on areas and by methods identified on Overlay Range MFP Step 3. Desert Shrub Control Conduct desert shrub control on areas and by prescribed methods identified on Overlay Range MFP Step 3.	Range management tradeoff is in the form of extent of area covered and methods to be used.
EC RM-1.9 Permit controlled burning of sacaton draws between January 1 and March 30.			RM-1.9 Permit controlled burning of sacaton draws between January 1 and March 30 with the following limitations and consideration: No burning will be conducted within 200 feet of a water source. Controlled burning will only be conducted during the month of March in Comanche Draw on Allotment 5057 in order to protect Baird's Sparrow and McCown's Longspur habitat requirements.	Range management tradeoffs are in the form of constraints in areas within 200 feet of water sources and timing in Comanche Draw.

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PLANNING SYSTEM INTERRELATIONSHIPS

LIVESTOCK MFP 1	OTHER RESOURCE STEP 1 INTERRELATIONSHIPS	MFP STEP 1 CONFLICTS (OR BENEFITS)	MFP PROPOSED DECISION	RESOURCE TRADEOFF
	EE/L WL-1.4 Provide habitat for a variety of prey species for kit fox, swift fox, ferruginous hawk, dusty hognosed snake and bull snake by managing former and crucial shortgrass areas towards grama-dominated by blue, black, or gyp grama.	Benefit - Vegetative treatment would increase shortgrass.	WL-1.4 This activity recommendation was accepted.	No tradeoffs are apparent.
	EE/L WL-1.6 Provide food and habitat in shortgrass communities by reserving plant material as follows: Reserve 88% of the annual seed head production of certain species.	This recommendation would reserve forage that has been identified as being necessary for livestock, however, the vegetative treatments would produce more seeds.	WL-1.6 This activity recommendation was rejected.	Grazing systems would provide some seed. However, the amount produced would be lower than that recommended, resulting in a tradeoff being made by wildlife.
	EC WL-7.5 To stabilize the habitats of the Baird's sparrow and McCown's Longspur. Make the development of a mosaic pattern of grasslands with a standing crop of seed a requirement of allotment management plans .	Benefit - vegetative treatment would increase shortgrass, and result in an even larger volume of seed being available.	WL-7.5 Consideration will be given to providing the amount of grass seed on a specific locality for wintering Baird's Sparrow and McCown's Longspur.	None. These treatments should increase grassland areas and extent of areas that can be developed into mosaic patterns through implementation of grazing systems.
	EE/L WL-1.7 Reduce the mesquite and creosote canopy cover to 15% or less in designated crucial areas and 15-25% in former shortgrass areas.	Direct benefit of vegetative treatment. This does not conflict with vegetative treatment objectives.	WL-1.7 This activity recommendation was accepted.	None. This recommendation benefits livestock as well as most wildlife.
	EE/L WL-1.21 & WL-6.1 Maintain riparian habitat by not permitting brush control in drainages leading into the Pecos River.	Much of the drainage areas would be capable of supporting good forage with vegetative treatment. This recommendation would not allow this to happen.	WL-1.21 & WL-6.1 This activity recommendation was rejected in part. Whole drainages would not be excluded from brush control, however, those portions containing tall woody plants would be excluded.	Mitigation would be applied on a site-specific basis.
	EE/L WL-1.24 Maintain habitat conditions in canyons, draws, on cliffs, and escarpments by not allowing brush control or surface disturbance within 300 yards of these areas.	This recommendation would reduce the amount of area that could be treated.	WL-1.24 Maintain habitat conditions in canyons, on cliffs and escarpments by not allowing brush control within 300 feet of these areas. Minimize surface disturbance associated with mineral activities by relocating developments whenever possible. Allow erosion control devices in appropriate areas.	Range management tradeoff would be a loss of forage production potential on these areas. The areal extent is so small there would be virtually no impact.
	EE/L WL-1.25 Maintain broadleaf tree habitats for listed classified species by establishing 500-yard buffer zones around groups of trees or large individual trees to exclude pad, pipeline road construction, and brush control.	This recommendation would reduce the area of land that could be treated.	WL-1.25 Establish a 300-yard buffer zone around identified individual and groups of broadleaf trees to exclude brush control. Minimize surface disturbance associated with mineral acitivities by relocating whenever possible.	Range management's tradeoff would be in the extent of area to be treated and any additional AUMs that would be produced. the areal extent is so small that it would have virtually no impact.

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PLANNING SYSTEM INTERRELATIONSHIPS

VESTOCK MFP 1	OTHER RESOURCE STEP 1 INTERRELATIONSHIPS	MFP STEP 1 CONFLICTS (OR BENEFITS)	MFP PROPOSED DECISION	RESOURCE TRADEOFF
	EE/L WL-2.6, 1.8, 1.18, 5.5 EC WL-1.3		EE/L WL-2.6	
	Maintain the existing mixed desert shrub community not allowing brush control or type conversion.	This recommendation would reduce the amount of land that could have vegetation treatments applied.	This activity recommendation was accepted. EC WL-1.3 Any desert shrub control on identified gray shrew areas will be done by a selective method as to not destroy their habitat. Buffer areas adjacent to riparian habitat areas will be untreated.	Mixed desert shrub communities have considerable forage value for both wildlife and livestock. It is also gray shrew habitat. However, full site potential for forage production would not be realized if brush control were not applied.
	EE/L WL-3.4		WL-3.4	
	Carry out mesquite and creosote control programs aimed at reducing canopy cover to 10-15 percent. These programs will include reseeding or seedling establishment programs maximizing a grass forb-legume community.	Benefit - vegetative treatment would improve shortgrass, and is in agreement with the vegetative treatment objectives.	This activity recommendation was accepted.	None. Beneficial to wildlife and livestock.
	EE/L WL-4.3 (Badger)		WL-4.3	
	Maintain the shortgrass aspect on areas noted on the overlay.	Benefit - This is not contradictory to the vegetative treatment objective.	This activity recommendation was accepted.	None. Beneficial to wildlife and livestock.
	EE/L WL-4.4 (Ring-tailed cat)		WL-4.4	
	Prevent surface disturbance activities along identified cliffs, canyons, bluffs, or drainages.	This recommendation would reduce the amount of area to receive vegetative treatment.	Maintain habitat conditions in canyons, on cliffs, and escarpments by not allowing brush control within 300 feet of these areas. Minimize surface disturbance associated with mineral activities by relocating developments whenever possible. Allow erosion control devices in appropriate areas.	This would be a range management tradeoff in extent of the area to be treated. The areal extent is so small, however, that there would be virtually no impact.
	EE/L WL-5.4		WL-5.4	
	Maintain the mesquite aspect of mesquite vegetative communities. Do not allow controls unless adequate measures are taken to meet the habitat need of quail occupying this community.	This recommendation would reduce the amount of area to receive vegetative treatment.	This activity recommendation was rejected.	Quail habitat conditions would be reduced. However, mesquite control through vegetative treatments does not normally change the aspect. Furthermore, mesquite kill in excess of 80% is not expected.
	EC WL-4.2		WL-4.2	
	Mesquite and creosote control projects should be carried out in areas noted. In addition to meeting other wildife species requirements, these programs should include reseeding utilizing forbs and legumes.	Benefit, should increase forage, is in agreement with vegetative treatment objectives.	Conduct mesquite control and creosote control. Any reseeding efforts will include forbs and legumes in the seeding mixture.	None. Beneficial to both wildlife and livestock.

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PLANNING SYSTEM INTERRELATIONSHIPS

LIVESTOCK MFP 1	OTHER RESOURCE STEP 1 INTERRELATIONSHIPS	MFP STEP 1 CONFLICTS (OR BENEFITS)	MFP PROPOSED DECISION	RESOURCE TRADEOFF
	EC WL-6.3 Maintain the aspect of the general vegetation types these furbearing animals depend on.	Some of these aspects may be changed by vegetative control, however, it is not anticipated because control measures are not normally 100% effective.	WL-6.3 Specific areas that are identified as being critical habitat areas for furbearers will not receive disturbance or change to the vegetative aspect type.	Furbearer critical habitat saved. Same area may be treated less intensively.
	EC WL-7.11, 9.6 9.7 To enhance the habitat of certain species, conduct mesquite control, reducing the canopy to 25% in those designated areas.	Often result of vegetative treatmens do not exceed 70% control of target species, so second treatments may be necessary.	WL-7.11 Mesquite control will be conducted on some of these habitat areas within the control method guidelines. This includes meeting requirements of scaled quail when feasible.	Both wildlife habitat and livestock forage should benefit. There would be little or no impact on scaled quail since complete mesquite kill is very unlikely.
	EC WL-7.13 To enhance the nesting success of the Marsh Hawk, Ferruginous Hawk and birds of prey in general protect the larger bushes and trees.	To protect the larger bushes and trees, some of the area to be treated may need to be deleted.	WL-7.13 Any mesquite control proposed for these habitat areas will use a selective means of control so as not to destroy the larger bushes and trees.	Larger bushes and trees would be saved while most mesquite would still be controlled. Some reduction in area to be treated could occur, but it would be so small that there would be virtually no impact.
EE/L RM-1.2, 1.3 EC RM-1.1, 1.10 Revise all existing AMPs. Develop or revise intensive grazing systems to incorporate as a minimum a 4 month rest standard 1 year out of every 4 during the growing season. More specifically they will meet the physiological needs of the key and major forage plants as determined on an allotment by allotment basis.			RM-1.1, 1.2, & 1.4 No conflicts were identified with the proposed minimum rest standard. Revise certain previously prepared AMPs to increase as much livestock forage as possible while still meeting the vegetative goals for wildlife habitat. A minimum rest standard of at least 4 months rest during the growing season for one year out of four will be applied.	
	EE/L WL-1.4 Provide habitat for a variety of prey species by managing former and crucial shortgrass areas towards grama-dominated potential. Grass cover should average 80% with species dominated by blue, black, or gyp grama.	None, beneficial to both activities.	WL-1.4 This activity recommendation was accepted.	This benefits livestock and wildlife.
	WL-1.5 Provide habitat for a variety of prey species by resting 50% of the shortgrass areas on allotments annually to furnish seed crops during fall and winter months to assure undisturbed nesting for plovers and curlews.	This recommendation would be in excess of the minimum rest requirement and may also be in excess of plant physiological need requirements, resulting in a loss of AUMs for livestock use.	This activity recommendation was rejected in part. Much of the needs indicated would be provided through specific grazing systems designed to meet plant physiological needs.	Wildlife tradeoff is primarily in terms of magnitude. Perhaps less than 50% of the area would be rested and perhaps for less than the time stated as being needed.

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IVESTOCK MFP 1	OTHER RESOURCE STEP 1 INTERRELATIONSHIPS	MFP STEP 1 CONFLICTS (OR BENEFITS)	MFP PROPOSED DECISION	RESOURCE TRADEOFF
	WL-1.16, 1.15, 5.9		WL-1.6, 1.15, 5.9	
	Provide food and habitat in shinnery oak and shortgrass communities by reserving plant material as follows: Reserve 80-88% of the annual seed head production of certain species.	This recommendation would perhaps reserve more seed head production than would be necessary to meet forage plant physiological needs, reducing the AUMs of forage available for livestock.	This activity recommendation was rejected.	Grazing systems may provide for a portion of the recommended amount of seed heads but some would not be provided.
	EE/L WL-2.2 (Area - All identified habitat)		WL-2.2	
	Design a grazing system that will maintain the present density of shinnery oak and increase acorn production by improving vigor through proper rest periods.	None. Grazing systems designed to meet forage plant physiological requirements should also provide this as growth periods are similar.	This activity recommendation was accepted through the implementation of AMPs.	No tradeoff is apparent.
	EE-L WL-2.3 (Area - All identified habitat)		WL-2.3	
	Include forbs and legumes in any revegetation (i.e., seeding) or vegetation manipulation projects (i.e., grazing systems) in identified suitable habitat.	None	This activity recommendation was accepted.	Both wildlife and livestock would utilize these. No tradeoff is apparent.
	EE/L WL-2.5		WL-2.5	
	Develop a grazing system with sufficient rest periods to adequately meet the phenological requirements of fourwing saltbush and that will establish a decadent plant seeding ratio of at least 1:1.	None	This activity recommendation was accepted.	Both wildlife and livestock desire this. No tradeoff is apparent.
	EE/L WL-3.1		WL-3.1	
	Identified high yield forb producing areas should be rested from livestock grazing from March through July annually.	This recommendation would remove these areas from grazing every year, reducing area available for livestock grazing.	This activity recommenda-was rejected in part. Some spring rest will occur on portions of the area in connection with grazing system development.	Grazing systems are expected to benefit the forb areas by periodic rest, however, it would not occur annually as recommended by wildlife.
	EE/L WL-3.2		WL-3.2	
	Grazing systems designed at maximizing and maintaining a grassland-forb community should be implemented on all identified antelope habitat.	None	The activity recommendation was accepted.	Both wildlife and livestock would benefit. No tradeoff is apparent.
	EE/L WL-3.3		WL-3.3	
	Reserve the forb component of available livestock forage for antelope consumption on occupied habitat.	This recommendation would necessitate total reservation of forage for wildlife because livestock prefer forbs also.	This activity recommendation was rejected.	Forb production would benefit from grazing systems, and due to rest requirements, a portion would be reserved for wildlife use.

LIVESTOCK MFP 1	OTHER RESOURCE STEP 1 INTERRELATIONSHIPS	MFP STEP 1 CONFLICTS (OR BENEFITS)	MFP PROPOSED DECISION	RESOURCE TRADEOFF
	EC R-2.1		R-2.1	
	Require that allotment management plans include sufficient rest periods to adequately meet the phenology of four-winged saltbush.	None	Require that allotment management plans in areas denoted on the overlay include sufficient rest periods to adequately meet the phenology of four-winged saltbush.	Both wildlife and livestock desire four-winged saltbush as a forage.
	EC WL-4.1		WL-4.1	
	All AMPs on antelope habitat should be designated as systems maximizing grass and forb production and forage allocations for antelope should be based on the potential number the allotment can support.	This recommendation would conflict with forage allocations for livestock.	Activity recommendation was accepted in part. Allocations of forage for population increase would be based on utilization. If utilization exceeds proper use levels, livestock numbers would be reduced.	Population growth would allowed for antelope and forage allocated based on a demonstrated need. Livestock forage tradeoff is a loss of forage should wildlife numbers increase.
	EC WL-7.3		WL-7.3	
	To stabilize and enhance the red-headed woodpecker and Mississippi kite habitat provide for the protection of mature cottonwoods in the riparian zones provide for seedling establishment of cottonwoods whether through grazing systems or with fenced plots until seedlings are established.	Impacts on grazing temporary until seedlings become established.	Activity recommendation was accepted.	Both wildlife and livestock would benefit from these areas of trees, once they have become established. The extent of the area to be protected is small and would have virtually no effect on range management.
	EC WL-7.5		WL-7.5	
	Make the development of a mosaic pattern of grasslands with a standing crop of seeds a requirement of allotment management plans.	None	Consideration will be given to providing the amount of grass seed on a specific locality for wintering Baird's Sparrow and McCown's Longspur.	Should be achieved through grazing system development, but may require longer rest periods than would be required to meet only plant physiological needs.
	EC WL-7.12		WL-7.12	
	To enhance the nesting success of the Long-eared Owl, Pigeon Hawk, Scissor-tailed Flycatcher, White-throated Sparrow and all ground nesting birds, exclude livestock grazing from certain areas March 1 to August 1 each year.	This has the potential of seriously impacting livestock grazing, depending mainly on the magnitude of the livestock exclusion.	Selected sites will be fenced and excluded from livestock grazed within habitat areas for the enhancement of nesting habitat for protected bird species. Emphasis will be placed to select only the key nesting sites.	Areas of livestock exclosure reduced, yet key nesting sites would be protected. Magnitude is not yet known, and will be developed during the activity planning process. Further analysis of impacts will occur at that time.

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LIVESTOCK MFP 1	OTHER RESOURCE STEP 1 INTERRELATIONSHIPS	MFP STEP 1 CONFLICTS (OR BENEFITS)	MFP PROPOSED DECISION	RESOURCE TRADEOFF
	EC WL-8.1 Declare the primary consideration and objective of lands within the defined critical area as the management of the lesser prairie chicken and stop all other activity recommendations that could have an adverse impact on the habitat, except those analyzed and stipulated in the oil and gas EAR until a habitat management plan is developed and approved.	Has the potential to completely eliminate livestock grazing in prairie chicken habitat.	WL-8.1 Develop a habitat management plan for the prairie chicken in this unit. This plan is to provide for grazing management techniques, land use restrictions, interpretation opportunities, and land acquisition plans.	Magnitude cannot be estimated until HMP is prepared.
	EC WL-8.2 Manage all delineated prairie chicken habitat to Sand Bluestem 9%, Little Bluestem 12%. On certain soil types, bluestems should be 25% along with average height of bluestems by species at 20 inches.	This is not expected to be difficult to achieve and maintain under livestock grazing.	WL-8.2 Average grazing utilization of bluestem plants should not exceed 25% on each of those allotments	This is not expected to be difficult to achieve while grazing livestock, as the proper use factor of little bluestem is 25%.
EE/L RM-2.1 EC RM-2.1 Designate the land identified on the MFP Step 1 Overlay, for disposal either through exchange, sale, or other means. Maintain existing management levels until lands have left federal ownership.			RM-2.1 Designate the land identified in certain allotments as potentially suitable for disposal via land exchange or public sale to improve the consolidation of public lands. These lands will remain in custodial management status until lands are exchanged or sold.	
EE/L RM-2.2 EC RM-2.6 Designate the public lands within allotments as having potential for exchange in order to facilitate improved range administration through consolidation of land ownerships.			RM-2.1, 2.6 Designate the lands identified in certain allotments as potentially suitable for disposal via land exchange to improve the consolidation of public lands. These lands will remain in custodial management status until the lands are exchanged.	

These recommendations provide land for various uses, often habitat. Exchange of these lands may make it more difficult to provide these uses or it may make it easier to provide these uses. The recommendations possibly influenced are: EE/L WL-1.4, 1.5, 1.6, 1.7, 1.14, 1.15, 1.23, 1.32, 1.33, 1.39, 2.8, 2.11, 3.9, 3.12, 4.2, 5.7, 5.9, 6.2, and EC WL-4.2, 7.3, 7.4, 7.11, 7.12, 8.1, 8.2, 8.3, 9.2, and 9.3.

Key:

MFP = Management Framework Plan
EE/L = East Eddy-Lea Planning Unit Recommendation
EC = East Chaves Planning Unit Recommendation
WL = Wildlife Recommendation
RM = Range Management Recommendation
R = Recreation

TABLE A-2
ALLOTMENT ACREAGE BY OWNERSHIP AND MANAGEMENT CATEGORY
(Source: Roswell District Files)

Allot. No.	Allotment Name	Total Acreage	Total State and Private Acreage	Other Federal Acreage	Public Lands
Existing Specific Grazing Systems					
5043	Sand Ranch	15,725	7,330		8,395
5046	Caprock Ranch	15,384	5,561		9,823
5053	Culp, C.	29,181	11,499		17,682
5C63	Culp, J.	5,848	2,904		2,944
5075	Bogle	399,374	168,872		230,502
5077	Williams, P.	32,282	13,454		18,828
5078	Slash ML Ranch	8,487	2,433		6,054
6007	Caviness	25,971	7,052		18,919
6022	Bingham	3,585	320		3,265
6028	Brininstool, W.	12,154	45		12,109
6037	Diamond & Half, Inc.	59,817	35,274		24,543
6038	James	28,561	3,245		25,316
6039	Robbins	13,907	3,409		10,498
6040	Brininstool, C.	7,511	760		6,751
7007	Haines	7,010	2,291		4,719
7019	Rains	7,421	990		6,431
7032	Sanders	77,682	11,471		66,211
7036	Madera & McDonald	21,305	2,209		19,096
7040	Jackson	58,127	4,702		53,425
7042	Twinwells	48,196	10,751		37,445
Subtotal 1		877,528	294,572		582,956
Proposed Specific Grazing Systems					
5005	Denton	27,391	21,170		6,221
5007	Cooper, M.	7,071	4,195		2,876
5010	Moorhead	5,907	3,429		2,478
5012	Moorhead	29,546	25,745		3,801
5014	McDowell (West)	2,813	923		1,890
5018	Bilberry	10,271	6,413		3,858
5019	Cooper, M.	6,659	3,062		3,597
5020	Sturgeon	6,245	1,632		4,613
5021	Wagner	7,792	4,006		3,786
5024	Durham	5,226	1,642		3,584
5025	Marley	9,473	4,675		4,798
5028	Bilbrey	13,462	6,632		6,830
5029	McCombs	6,761	3,830		2,931
5032	Davis	14,531	6,052		8,479
5034	Seeligson	28,620	15,698		12,922
5036	Cooper, C.	8,635	5,524		3,111
5037	McCrea	24,613	10,716		13,897
5038	Graham, Ly.	15,625	7,677		7,948
5039	Sandhills	4,735	3,145		1,590
5040	Harral	10,576	4,485	390	5,701
5044	Isler	3,444	2,083		1,361
5047	Hilburn	3,482	1,232		2,250
5049	Clemmons & Erdmann	7,441	2,013		5,428
5051	Marley	22,590	4,838		17,752
5057	Tigner	2,612	1,388		1,224
5058	Lynch	5,155	2,030		3,125
5062	Garnsey	10,359	6,086		4,273
5065	Graham, A.	11,199	5,075		6,124
5066	Spears	3,880	1,360		2,520
5068	Malstrom	28,176	14,453		13,723
5069	VHV Cattle	32,743	21,633		11,110
5072	Watson	17,247	8,568		8,679
5073	Derrick, M.	5,553	2,597		2,956
5074	Barbe	11,278	3,985		7,293
5079	S & S Corp.	8,638	6,081		2,557
5082	Gomez	1,566	777		789
5083	Wilson	6,136	2,693		3,443
5084	Greenwood	10,309	2,160		8,149
5085	Taylor & Medlin	17,671	11,967		5,704
5088	Derrick & Merritt	7,609	1,319		6,290
5090	Sams & Dean	4,920	1,783		3,137
5091	Derrick, R.	4,270	2,572		1,698
5092	Merritt, Wm.	5,854	640		5,214
6004	Warren	9,014	5,998		3,016

(A)Allotments 7037 and 7038 are operated by the rancher as one operation, therefore, the information has been combined.

TABLE A-2
ALLOTMENT ACREAGE BY OWNERSHIP AND MANAGEMENT CATEGORY
(Source: Roswell District Files)

Allot. No.	Allotment Name	Total Acreage	Total State and Private Acreage	Other Federal Acreage	Public Lands
6006	Caswell	26,878	9,229		17,649
6008	Linam	13,677	2,626		11,051
6009	Scharbauer	29,866	9,850		20,016
6011	Smith, M.	22,955	8,680		14,275
6020	Berry	21,618	5,797		15,821
6021	Smith, Wm.	17,203	2,804		14,399
6027	Merchant	36,261	21,705		14,556
6029	Ward	10,059	2,882		7,177
6030	Deep Well	4,946	1,120		3,826
6033	Dinwiddie	23,210	6,460		16,750
6035	Madera, R.	12,986	2,680		10,306
6042	Dublin	8,700	1,959		6,741
6043	Beckham	21,641	8,454		13,187
6044	Madera, M. (W)	5,406	1,747		3,659
6044	Madera, M. (E)	15,421	2,112		13,309
6045	Madera, M. & K. (E)	6,660	1,892		4,768
6045	Madera, M. & K. (SW)	16,173	1,372		14,801
6045	Madera, M. & K. (NW)	13,199	2,830		10,369
6046	McDonald	5,926	915		5,011
7003	Holeman	5,170	1,968		3,202
7004	Martin	16,653	2,288		14,365
7005	Johnson, G.	3,088	1,342		1,746
7006	Gissler	4,713	850	375	3,488
7008	Williams	24,879	5,586		19,293
7011	Netherlin	10,187	3,399	1,375	5,413
7012	Snyder, L.T.D.	148,963	27,376		121,587
7013	Slash X Ranch	58,391	8,111		50,280
7014	Stagner & Forehand	7,651	1,648		6,003
7015	Angell	15,408	2,683		12,725
7016	Fanning	11,932	832	2,703	8,397
7018	Clayton	12,415	6,865	923	4,627
7020	Spears, J.	18,322	700		17,622
7021	Campbell	12,995	2,610		10,385
7022	Key	54,206	8,056		46,150
7025	West	6,852	1,590		5,262
7026	Pue	2,905	160		2,745
7027	Smith	61,887	14,190		47,697
7028	Clark	8,940	1,287		7,653
7031	Grandi	30,221	6,192		24,029
7033	Mobley	15,743	2,903		12,840
7034	Greenwood	9,620	3,556		6,064
7035	J & M Farms	6,649	1,816		4,833
7037(A)	Delaware)	21,223	2,013		19,210
7038	Delaware)				
7039	Lindsay	21,000	3,951		17,049
7041	Johnson, W.	8,299	928	77	7,294
Subtotal 2		1,398,195	461,996	5,843	930,356
No Specific Grazing Systems					
5001	Sea Cattle	3,300			3,300
5002	Gainer	350			350
5003	N. Plains Land & Inv.	120			120
5004	Boone	7,303	4,243		3,060
5006	Van Eaton	160			160
5008	Van Eaton	8,632	6,290		2,342
5009	Marley	20,541	17,611		2,930
5011	Moorhead	12,837	10,955		1,882
5013	Goods, Inc.	13,071	11,010		2,061
5014	McDowell (East)	160			160
5015	Southard, F.	160			160
5016	Southard, T.	1,370			1,370
5017	Southard, J.	320			320
5022	Smith, H.	400			400
5023	White	4,238	3,205		1,033
5026	Faircloth	917			917
5027	Nuckols	737			737
5030	Jenkins	320			320
5031	Huston	951			951
5033	Cato	690			690
5035	Whitelakes	1,274	320		954
5039	Red Tank	80			80

TABLE A-2
ALLOTMENT ACREAGE BY OWNERSHIP AND MANAGEMENT CATEGORY
(Source: Roswell District Files)

Allot. No.	Allotment Name	Total Acreage	Total State and Private Acreage	Other Federal Acreage	Public Lands
5039	Sherman Cattle	400			400
5042	Glenn	640			640
5045	Caprock Ranch	1,440			1,440
5050	Clemmons & Erdmann	1,730			1,730
5052	Marley	40			40
5054	Irvin	390			390
5056	Graham, Li.	354			354
5059	Wilson	4,641	3,609		1,032
5060	Sallee	1,285	1,059		226
5061	Woods	1,190	850		340
5064	Lee	880			880
5070	Miles	1,310	880		430
5071	Glass	80			80
5081	Greer	4,079	3,092		987
5089	Medlin, B.	400			400
5093	Haley	96			96
6001	McCrory	40			40
6002	Field	29			29
6003	Taylor & Heidel	40			40
6010	Snyder, L.T.D.	520			520
6012	Sims	40			40
6013	Klein	320			320
6014	S & W Cattle	1,800			1,800
6015	Kornegay	1,600			1,600
6016	Terry	807			807
6017	Hill	840			840
6018	Turland	1,240			1,240
6019	Cooper, D.	960			960
6024	Wallach	120			120
6025	Robinson	1,868			1,868
6026	Robinson	1,122			1,122
6028	Brininstool, Wm.	1,280			1,280
6029	Ward	120			120
6031	Goins	560			560
6032	Winters	640			640
6034	Wylie	2,130			2,130
6035	Madera, R.	3,201			3,201
6036	Madera, R.	80			80
6041	Dinwiddie	590			590
6047	Deck	2,612			2,612
6048	Maddox	5,831			5,831
6049	Snyder, L.T.D. (Hart)	10,190	6,670		3,520
6050	Hilburn	40			40
7001	Haven	3,104	1,729		1,375
7002	Karr	2,246	1,578		668
7009	Evans	901			901
7010	Solt	2,220	320		1,900
7017	Greenwood, H.	1,030			1,030
7023	Beker, Ind.	2,121	994		1,127
7024	Simpson	3,423	1,628		1,795
7029	Bond	6,165	4,470		1,695
7030	Tracy	619			619
Subtotal 3		157,335	80,513		76,822
Unallotted					
Parcel 1		40			40
Parcel 2		308			308
Parcel 3		49			49
Parcel 4		36			36
Parcel 5		40			40
Parcel 6		40			40
Parcel 7		40			40
Parcel 8		26			26
Parcel 9		40			40
Parcel 10 Mathers		91			91
Parcel 11 South Dune Area "A"		1,885			1,885
Parcel 12 Potash Mill Site		2,966			2,966
Subtotal 4		5,561			5,561
Subtotal 1		877,528	294,572		582,956
Subtotal 2		1,398,195	461,996	5,843	930,356
Subtotal 3		157,335	80,513		76,822
Subtotal 4		5,561			5,561
GRANDTOTAL		2,438,619	837,081	5,843	1,595,695

(A)Allotments 7037 and 7038 are operated by the rancher as one operation, therefore, the information has been combined.

TABLE A-3
PRESENT USE, PRESENT FORAGE PRODUCTION, AND PROPOSED FORAGE ALLOCATION (SHORT RUN) FOR EACH ALLOTMENT BY GRAZING SYSTEMS' INTENSITY CATEGORY (SHORT RUN BEING UNTIL FORAGE PRODUCTION INCREASES)

(Source: Roswell District Files)

Allotments		Present Use		Present Forage Production				Proposed Forage Allocation			Proposed Change	
No.	Name	* Average Licensed Use (AUMs)	* Grazing Preference (AUMs)	Total (AUMs)	* Suitable Lands (AUMs)	* Unsuitable Lands (AUMs)	* Excluded Lands (AUMs)	To Big Game (AUMs)	To Livestock (AUMs)	* Residual From Unsuitable (AUMs)	From Licensed Use (AUMs)	From Preference (AUMs)
Existing Specific Grazing Systems												
5043	Sand Ranch	1,510	1,650	987	987	0	0	7	980	0	-530	-670
5046	Caprock Ranch	1,578	1,578	844	797	0	47	42	755	0	-823	-823
5053	Culp, C.	1,996	2,847	2,512	2,439	0	73	15	2,424	0	+428	-423
5063	Culp, J.	375	449	359	359	0	0	38	321	0	-54	-128
5075	Bogle	27,113	37,940	22,325	21,442	855	28	262	21,204	831	-5,909	-16,736
5077	Williams, P.	2,628	2,978	2,107	1,990	0	117	39	1,951	0	-677	-1,027
5078	Slash ML Ranch	1,155	966	584	569	15	0	14	556	14	-599	-410
6007	Caviness	2,660	2,622	1,688	1,688	0	0	28	1,660	0	-1,000	-962
6022	Bingham	1,080	1,080	341	341	0	0	3	338	0	-742	-742
6028	Brininstool, W.	1,842	2,383	1,064	1,064	0	0	26	1,038	0	-804	-1,345
6037	Diamond & Half, Inc.	4,344	4,344	3,409	3,353	56	0	14	3,341	54	-1,003	-1,003
6038	James	2,956	3,774	5,095	5,095	0	0	39	5,056	0	+2,100	+1,282
6039	Robbins	1,910	2,580	1,080	1,080	0	0	7	1,073	0	-837	-1,507
6040	Brininstool, C.	1,027	1,476	752	752	0	0	6	746	0	-281	-730
7007	Haines	502	630	446	446	0	0	7	439	0	-63	-191
7019	Rains	467	940	326	326	0	0	9	317	0	-150	-623
7032	Sanders	8,827	13,236	8,694	8,694	0	0	150	8,544	0	-283	-4,692
7036	Madera & McDonald	1,731	3,348	1,813	1,742	71	0	27	1,717	69	-14	-1,631
7040	Jackson	5,617	11,327	5,525	5,476	49	0	70	5,410	45	-207	-5,917
7042	Twinwells	5,334	8,251	4,362	4,325	37	0	78	4,249	35	-1,085	-4,002
Subtotals		74,652	104,399	64,313	62,965	1,083	265	881	62,119	1,048	-12,533	-42,280
Proposed Specific Grazing Systems												
5005	Denton	1,200	1,200	722	678	0	44	5	673	0	-527	-527
5007	Cooper, M.	480	480	555	555	0	0	38	517	0	+37	+37
5010	Moorhead	516	516	293	271	0	22	5	266	0	-250	-250
5012	Moorhead	720	720	575	518	0	57	4	514	0	-206	-206
5014	McDowell (West)	384	384	141	141	0	0	2	139	0	-245	-245
5018	Bilberry	584	584	335	323	0	12	10	313	0	-271	-271
5019	Cooper, M.	537	536	576	576	0	0	34	542	0	+5	+6
5020	Sturgeon	1,011	1,011	627	627	0	0	58	569	0	-442	-442
5021	Wagner	853	853	716	716	0	0	50	666	0	-187	-187
5024	Durham	663	663	1,063	1,063	0	0	46	1,017	0	+354	+354
5025	Marley	813	944	1,286	1,286	0	0	62	1,224	0	+411	+280
5028	Bilbrey	1,839	1,498	950	930	0	20	18	912	0	-927	-586
5029	McCombs	663	663	437	422	0	15	6	416	0	-247	-247
5032	Davis	1,656	1,656	1,092	1,025	0	67	23	1,002	0	-654	-654
5034	Seeligson	2,869	2,869	1,563	1,551	0	12	19	1,532	0	-1,337	-1,337
5036	Cooper, C.	482	503	851	851	0	0	40	811	0	+329	+308
5037	McCrea	2,315	2,907	2,489	2,489	0	0	171	2,318	0	+3	-589
5038	Graham, Ly.	2,698	1,608	873	873	0	0	7	866	0	-1,832	-742
5039	Sandhills	336	336	276	194	0	82	2	192	0	-144	-144
5040	Harral	1,255	1,255	1,005	1,005	0	0	77	928	0	-327	-327
5044	Isler	186	297	183	183	0	0	1	182	0	-4	-115
5047	Hilburn	314	314	496	481	0	15	5	476	0	+162	+162
5049	Clemmons & Erdmann	840	840	705	705	0	0	13	692	0	-148	-148
5051	Marley	2,713	2,882	3,152	3,053	0	99	68	2,985	0	+272	+103
5057	Tigner	228	228	368	368	0	0	16	352	0	+124	+124
5058	Lynch	555	528	327	327	0	0	38	289	0	-266	-239
5062	Garnsey	710	720	1,066	1,066	0	0	52	1,014	0	+304	+294
5065	Graham, A.	898	972	915	895	0	20	58	837	0	-61	-135

(A) AUMs included in 7012. The preferences for allotments 7012 and 6049 are added together because they belong to the same ranch operation.

(B) AUMs included in 6044. Licensed use for allotments are added together because they all belong to the same ranch operation.

(C) AUMs included in 6045. Licensed use for allotments are added together because they all belong to the same ranch operation.

* Note: Suitability refers only to domestic livestock use. All use is on a yearlong basis, actual use is considered to be the same as licensed use, and licensed use some times exceeds preference because of temporary, nonrenewable authorizations.

TABLE A-3
PRESENT USE, PRESENT FORAGE PRODUCTION, AND PROPOSED FORAGE ALLOCATION (SHORT RUN) FOR EACH ALLOTMENT BY GRAZING SYSTEMS' INTENSITY CATEGORY (SHORT RUN BEING UNTIL FORAGE PRODUCTION INCREASES)
(Source: Roswell District Files)

Allotments		Present Use		Present Forage Production				Proposed Forage Allocation			Proposed Change	
No.	Name	* Average Licensed Use (AUMs)	* Grazing Preference (AUMs)	Total (AUMs)	* Suitable Lands (AUMs)	* Unsuitable Lands (AUMs)	* Excluded Lands (AUMs)	To Big Game (AUMs)	To Livestock (AUMs)	* Residual From Unsuitable (AUMs)	From Licensed Use (AUMs)	From Preference (AUMs)
5066	Spears	406	406	494	494	0	0	33	461	0	+55	+55
5068	Malstrom	2,145	2,145	1,462	1,421	0	41	12	1,409	0	-736	-736
5069	VHV Cattle	2,601	1,785	1,706	1,700	6	0	48	1,654	4	-947	-131
5072	Watson	879	1,654	939	939	0	0	6	933	0	+54	-721
5073	Derrick, M.	521	521	498	498	0	0	3	495	0	-26	-26
5074	Barbe	1,050	1,050	1,289	1,289	0	0	6	1,283	0	+233	+233
5079	S & S Corp.	340	377	191	191	0	0	14	177	0	-163	-200
5082	Gomez	56	143	43	43	0	0	3	40	0	-16	-103
5083	Wilson	597	596	196	190	6	0	0	190	6	-407	-406
5084	Greenwood	1,412	1,683	1,097	1,030	67	0	6	1,025	66	-387	-658
5085	Taylor & Medlin	1,068	1,068	627	627	0	0	17	610	0	-458	-458
5088	Derrick & Merritt	502	1,458	479	479	0	0	5	474	0	-28	-984
5090	Sams & Dean	540	540	314	314	0	0	1	313	0	-227	-227
5091	Derrick, R.	333	338	79	74	5	0	0	74	5	-259	-264
5092	Merritt, Wm.	588	1,106	770	770	0	0	5	765	0	+177	-341
6004	Warren	444	444	423	423	0	0	3	420	0	-24	-24
6006	Caswell	1,786	2,400	3,055	3,047	8	0	10	3,037	8	+1,251	+637
6008	Linam	1,300	1,785	992	992	0	0	11	981	0	-319	-804
6009	Scharbauer	2,902	3,512	3,438	3,438	0	0	62	3,376	0	+474	-136
6011	Smith, M.	2,155	2,832	1,414	1,414	0	0	16	1,398	0	-757	-1,434
6020	Berry	3,334	3,553	2,152	2,152	0	0	30	2,122	0	-1,212	-1,431
6021	Smith, Wm.	3,215	3,617	1,570	1,570	0	0	12	1,558	0	-1,657	-2,059
6027	Merchant	2,968	2,968	2,106	2,105	1	0	24	2,082	0	-886	-886
6029	Ward	1,151	1,151	688	688	0	0	6	682	0	-469	-469
6030	Deep Well	612	612	308	308	0	0	4	304	0	-308	-308
6033	Dinwiddie	2,919	3,420	2,013	1,980	33	0	2	1,978	33	-941	-1,442
6035	Madera, R.	1,613	1,791	1,772	1,772	0	0	2	1,770	0	+157	-21
6042	Dublin	804	804	337	337	0	0	0	337	0	-467	-467
6043	Beckham	2,141	2,343	1,833	1,833	0	0	0	1,833	0	-308	-510
6044	Madera, M.	1,916	660	222	202	20	0	0	202	20	+878	-458
6044	Madera, M.	(B)	2,304	2,592	2,592	0	0	0	2,592	0	(B)	+288
6045	Madera, M. & K.(E)	1,777	905	335	335	0	0	2	333	0	-354	-572
6045	Madera, M. & K. (SW)	(C)	3,029	1,162	1,095	67	0	6	1,090	66	(C)	-1,939
6045	Madera, M. & K. (NW)	2,237	2,640	902	902	0	0	6	896	0	-1,341	-1,744
6046	McDonald	706	857	339	339	0	0	0	339	0	-367	-518
7003	Holeman	567	567	355	355	0	0	5	350	0	-217	-217
7004	Martin	1,262	1,806	1,263	1,248	15	0	17	1,232	14	-30	-574
7005	Johnson, G.	221	278	107	107	0	0	2	105	0	-116	-173
7006	Gissler	672	672	404	404	0	0	5	399	0	-273	-273
7008	Williams	2,740	2,819	1,356	1,312	44	0	27	1,286	43	-1,454	-1,533
7011	Netherlin	923	923	387	387	0	0	7	380	0	-543	-543
7012	Snyder, L.T.D.	21,141	(A)21,319	10,038	9,645	388	5	82	9,573	378	-11,568	(A)-11,366
7013	Slash X Ranch	7,365	10,200	3,912	3,763	149	0	43	3,724	145	-3,641	-6,476
7014	Stagner & Forehand	342	970	580	580	0	0	9	571	0	+229	-399
7015	Angell	1,507	1,507	1,203	1,203	0	0	16	1,187	0	-320	-320
7016	Fanning	1,134	1,215	1,009	995	14	0	11	985	13	-149	-230
7018	Clayton	377	420	258	228	29	1	8	222	27	-155	-198
7020	Spears, J.	1,933	2,362	1,145	1,123	22	0	19	1,106	20	-827	-1,256
7021	Campbell	1,959	2,274	1,232	1,232	0	0	21	1,211	0	-748	-1,063
7022	Key	6,332	6,324	4,057	3,589	468	0	53	3,542	462	-2,790	-2,782
7025	West	421	420	443	443	0	0	6	437	0	+16	+17
7026	Pue	418	564	183	183	0	0	3	180	0	-238	-384
7027	Smith	6,568	7,769	4,009	3,904	102	3	63	3,849	94	-2,719	-3,920
7028	Clark	1,174	1,173	870	848	22	0	17	833	20	-341	-340
7031	Grandi	2,766	2,789	1,502	1,472	30	0	27	1,447	28	-1,319	-1,342
7033	Mobley	1,309	1,953	1,171	1,055	116	0	24	1,037	110	-272	-916
7034	Greenwood	1,067	1,066	416	388	28	0	7	382	27	-685	-684
7035	J & M Farms	205	443	450	438	12	0	6	433	11	+228	-10
7037	Delaware	2,040	3,984	1,801	1,692	109	0	35	1,658	108	-382	-2,326
7038	Delaware	192	192	79	77	2	0	0	77	2	-115	-115
7039	Lindsay	2,957	2,957	1,970	1,449	496	25	23	1,432	490	-1,525	-1,525
7041	Johnson, W.	819	819	496	464	32	0	8	458	30	-361	-361
Subtotal		143,747	162,249	102,170	99,339	2,291	540	1,827	97,573	2,230	-46,174	-64,296

TABLE A-3

PRESENT USE, PRESENT FORAGE PRODUCTION, AND PROPOSED FORAGE ALLOCATION (SHORT RUN) FOR EACH ALLOTMENT BY GRAZING SYSTEMS' INTENSITY CATEGORY (SHORT RUN BEING UNTIL FORAGE PRODUCTION INCREASES)

(Source: Roswell District Files)

Allotments		Present Use		Present Forage Production				Proposed Forage Allocation			Proposed Change	
No.	Name	* Average Licensed Use (AUMs)	* Grazing Preference (AUMs)	Total (AUMs)	* Suitable Lands (AUMs)	* Unsuitable Lands (AUMs)	* Excluded Lands (AUMs)	To Big Game (AUMs)	To Livestock (AUMs)	* Residual From Unsuitable (AUMs)	From Licensed Use (AUMs)	From Preference (AUMs)
No Specific Grazing Systems												
5001	Sea Cattle	660	660	389	389	0	0	41	348	0	-312	-312
5002	Gainer	72	72	29	29	0	0	4	25	0	-47	-47
5003	N. Plains Land & Inv.	40	40	15	15	0	0	0	15	0	-25	-25
5004	Boone	768	768	439	439	0	0	3	436	0	-332	-332
5006	Van Eaton	48	48	11	11	0	0	0	11	0	-37	-37
5008	Van Eaton	410	490	376	367	9	0	18	351	7	-59	-139
5009	Marley	552	624	260	239	0	21	3	236	0	-316	-388
5011	Moorhead	516	516	209	209	0	0	5	204	0	-312	-312
5013	Goods, Inc.	384	384	199	184	0	15	2	182	0	-202	-202
5014	McPowell (East)	72	72	18	18	0	0	0	18	0	-54	-54
5015	Southard, F.	36	36	13	13	0	0	0	13	0	-23	-23
5016	Southard, T.	144	144	138	122	0	16	5	117	0	-27	-27
5017	Southard, J.	60	60	37	37	0	0	0	37	0	-23	-23
5022	Smith, H.	36	36	79	79	0	0	0	79	0	+43	+43
5023	White	212	212	177	177	0	0	8	169	0	-43	-43
5026	Faircloth	216	216	215	215	0	0	1	214	0	-2	-2
5027	Nuckols	144	144	63	50	0	13	1	49	0	-95	-95
5030	Jenkins	84	84	46	46	0	0	0	46	0	-38	-38
5031	Huston	243	243	210	210	0	0	0	210	0	-33	-33
5033	Cato	144	144	91	91	0	0	0	91	0	-53	-53
5035	Whitelakes	192	192	91	91	0	0	1	90	0	-102	-102
5039	Red Tank	16	16	9	9	0	0	0	9	0	-7	-7
5039	Sherman Cattle	80	80	46	46	0	0	0	46	0	-34	-34
5042	Glenn	108	108	68	68	0	0	0	68	0	-40	-40
5045	Caprock Ranch	316	316	146	146	0	0	11	135	0	-181	-181
5050	Clemmons & Erdmann	468	468	229	229	0	0	5	224	0	-244	-244
5052	Marley	12	12	9	9	0	0	0	9	0	-3	-3
5054	Irvin	84	84	133	133	0	0	4	129	0	+45	+45
5056	Graham, Li.	60	60	87	87	0	0	0	87	0	+27	+27
5059	Wilson	228	228	118	118	0	0	12	106	0	-122	-122
5060	Sallee	24	24	35	35	0	0	4	31	0	+7	+7
5061	Woods	43	48	83	83	0	0	0	83	0	+40	+35
5064	Lee	176	176	109	109	0	0	0	109	0	-67	-67
5070	Miles	60	60	54	54	0	0	2	52	0	-8	-8
5071	Glass	12	12	11	11	0	0	0	11	0	-1	-1
5081	Greer	138	178	115	115	0	0	4	111	0	-27	-67
5089	Medlin, B.	180	180	60	60	0	0	0	60	0	-120	-120
5093	Haley	12	20	4	4	0	0	0	4	0	-8	-16
6001	McCrory	12	12	10	10	0	0	0	10	0	-2	-2
6002	Field	5	5	7	7	0	0	3	4	0	-1	-1
6003	Taylor & Heidel	11	11	6	6	0	0	0	6	0	-5	-5
6010	Snyder, L.T.D.	96	96	51	51	0	0	1	50	0	-46	-46
6012	Sims	12	12	2	2	0	0	0	2	0	-10	-10
6013	Klein	78	78	40	40	0	0	0	40	0	-38	-38
6014	S & W Cattle	406	406	83	83	0	0	0	83	0	-323	-323
6015	Kornegay	300	300	72	72	0	0	0	72	0	-228	-228
6016	Terry	197	197	76	75	1	0	0	75	1	-122	-122
6017	Hill	236	236	39	39	0	0	0	39	0	-197	-197
6018	Turland	116	116	57	57	0	0	0	57	0	-59	-59
6019	Cooper, D.	269	269	67	67	0	0	1	66	0	-203	-203
6024	Wallach	23	23	10	10	0	0	0	10	0	-13	-13
6025	Robinson	526	526	239	239	0	0	2	237	0	-289	-289
6026	Robinson	180	180	127	127	0	0	0	127	0	-53	-53
6028	Brininstool, Wm.	252	252	79	79	0	0	0	79	0	-173	-173
6029	Ward	20	20	4	4	0	0	0	4	0	-16	-16
6031	Goins	158	158	73	73	0	0	0	73	0	-85	-85
6032	Winters	216	216	50	47	3	0	0	47	3	-169	-169
6034	Wylie	408	408	246	246	0	0	2	244	0	-164	-164
6035	Madera, R.	612	612	598	598	0	0	0	598	0	-14	-14
6036	Madera, R.	24	24	4	4	0	0	0	4	0	-20	-20

TABLE A-3
PRESENT USE, PRESENT FORAGE PRODUCTION, AND PROPOSED FORAGE ALLOCATION (SHORT RUN) FOR EACH ALLOTMENT BY GRAZING SYSTEMS' INTENSITY CATEGORY (SHORT RUN BEING UNTIL FORAGE PRODUCTION INCREASES)

(Source: Roswell District Files)

Allotments		Present Use		Present Forage Production				Proposed Forage Allocation			Proposed Change	
No.	Name	* Average Licensed Use (AUMs)	* Grazing Preference (AUMs)	Total (AUMs)	* Suitable Lands (AUMs)	* Unsuitable Lands (AUMs)	* Excluded Lands (AUMs)	To Big Game (AUMs)	To Livestock (AUMs)	* Residual From Unsuitable (AUMs)	From Licensed Use (AUMs)	From Preference (AUMs)
6041	Dinwiddie	48	48	84	82	2	0	0	82	2	+34	+34
6047	Deck	490	490	301	299	2	0	3	296	2	-194	-194
6048	Maddox	1,524	1,524	811	811	0	0	13	798	0	-726	-726
6049	Snyder, L.T.D. (Hart)	713	(A)	391	391	0	0	11	380	0	-333	(A)
6050	Hilburn	12	12	10	10	0	0	0	10	0	-2	-2
7001	Haven	176	264	50	50	0	0	2	48	0	-128	-216
7002	Karr	120	120	35	35	0	0	0	35	0	-85	-85
7009	Evans	96	96	37	37	0	0	2	35	0	-61	-61
7010	Solt	347	347	159	159	0	0	5	154	0	-193	-193
7017	Greenwood, H.	180	180	36	36	0	0	2	34	0	-146	-146
7023	Beker, Inc.	104	156	80	80	0	0	2	78	0	-26	-78
7024	Simpson	175	175	138	138	0	0	2	136	0	-39	-39
7029	Bond	210	210	158	158	0	0	0	158	0	-52	-52
7030	Tracy	84	84	33	33	0	0	0	33	0	-51	-51
Subtotal		15,486	15,118	8,684	8,602	17	65	185	8,419	15	-7,067	-7,079
Subtotal 1		74,652	104,399	64,313	62,965	1,083	265	881	62,119	1,048	-12,533	-42,280
Subtotal 2		143,747	162,249	102,170	99,339	2,291	540	1,827	97,573	2,230	-46,174	-64,296
Subtotal 3		15,486	15,118	8,684	8,602	17	65	185	8,419	15	-7,067	-7,079
GRANDTOTAL		233,885	281,766	175,167	170,906	3,391	870	2,893	168,111	3,293	-65,774	-113,655

(A) AUMs included in 7012. The preferences for allotments 7012 and 6049 are added together because they belong to the same ranch operation.

(B) AUMs included in 6044. Licensed use for allotments are added together because they all belong to the same ranch operation.

(C) AUMs included in 6045. Licensed use for allotments are added together because they all belong to the same ranch operation.

* Note: Suitability refers only to domestic livestock use. All use is on a yearlong basis. Actual use is considered to be the same as licensed use, and licensed use sometimes exceeds preference because of temporary nonrenewable authorizations.

TABLE A-4
PRESENT USE, ANTICIPATED FUTURE FORAGE PRODUCTION, AND FORAGE ALLOCATIONS IN THE LONG-RUN (BY THE YEAR 2000)
(Source: Roswell District Files and Soil Survey: Chaves, Eddy, and Lea Counties)

Allotments		Present Use		Anticipated Future Forage Production				Anticipated Future Forage Allocation			Anticipated Change	
No.	Name	Average Licensed Use (AUMs)	Grazing Preference (AUMs)	Total (AUMs)	Suitable Lands* (AUMs)	Unsuitable Lands* (AUMs)	Excluded Lands* (AUMs)	Forage Allocation To Big Game (AUMs)	Forage Allocation To Live stock (AUMs)	Residual Forage From Unsuitable Lands* (AUMs)	From Licensed Use (AUMs)	From Preference (AUMs)
Existing Specific Grazing Systems												
5043	Sand Ranch	1,510	1,650	1,111	1,111	0	0	7	1,104	0	-406	-546
5046	Caprock Ranch	1,578	1,578	844	797	0	47	42	755	0	-823	-823
5053	Culp, C.	1,996	2,847	2,679	2,606	0	73	15	2,591	0	+595	-256
5063	Culp, J.	375	449	567	567	0	0	38	529	0	+154	+80
5075	Bogle	27,113	37,940	46,403	46,375	0	28	262	46,113	0	+19,000	+8,173
5077	Williams, P.	2,628	2,978	2,569	2,452	0	117	39	2,413	0	-215	-565
5078	Slash ML Ranch	1,155	966	780	765	15	0	14	752	14	-403	-214
6007	Caviness	2,660	2,622	4,494	4,494	0	0	28	4,466	0	+1,806	+1,844
6022	Bingham	1,080	1,080	717	717	0	0	3	714	0	-366	-366
6028	Brininstool, W.	1,842	2,383	4,035	4,035	0	0	26	4009	0	+2,167	+1,626
6037	Diamond & Half, Inc.	4,344	4,344	7,277	7,277	0	0	14	7,263	0	+2,919	+2,919
6038	James	2,956	3,774	8,333	8,333	0	0	46	8,287	0	+5,331	+4,513
6039	Robbins	1,910	2,580	1,922	1,922	0	0	7	1,915	0	+5	-665
6040	Brininstool, C.	1,027	1,476	1,650	1,650	0	0	6	1,644	0	+617	+168
7007	Haines	502	630	1,029	1,029	0	0	7	1,022	0	+520	+392
7019	Rains	467	940	1,462	1,462	0	0	9	1,453	0	+9,86	+513
7032	Sanders	8,827	13,236	20,937	20,937	0	0	150	20,787	0	+11,960	+7,551
7036	Madera & McDonald	1,731	3,348	5,902	5,902	0	0	40	5,862	0	+4,131	+2,514
7040	Jackson	5,617	11,327	17,920	17,920	0	0	83	17,837	0	+12,220	+6,510
7042	Twinwells	5,334	8,251	12,447	12,447	0	0	91	12,356	0	+7,022	+4,105
Subtotal 1		74,652	104,399	143,078	142,798	15	265	927	141,872	14	+67,220	+37,473
Proposed Specific Grazing Systems												
5005	Denton	1,200	1,200	964	920	0	44	5	915	0	-285	-285
5007	Cooper, M.	480	480	808	808	0	0	38	770	0	+290	+290
5010	Moorhead	516	516	293	271	0	22	5	266	0	-250	-250
5012	Moorhead	720	720	597	540	0	57	4	536	0	-184	-184
5014	McDowell (West)	384	384	141	141	0	0	2	139	0	-245	-245
5018	Bilberry	584	584	335	323	0	12	10	313	0	-271	-271
5019	Cooper, M.	537	536	914	914	0	0	34	880	0	+343	+344
5020	Sturgeon	1,011	1,011	1,069	1,069	0	0	58	1,011	0	0	0
5021	Wagner	853	853	1,109	1,109	0	0	50	1,059	0	+206	+206
5024	Durham	663	663	1,063	1,063	0	0	46	1,017	0	+354	+354
5025	Marley	813	944	1,286	1,286	0	0	62	1,224	0	+411	+280
5028	Bilbrey	1,839	1,498	1,391	1,371	0	20	18	1,353	0	-486	-145
5029	McCombs	663	663	437	422	0	15	6	416	0	-247	-247
5032	Davis	1,656	1,656	1,092	1,025	0	67	23	1,002	0	-654	-654
5034	Seeligson	2,869	2,869	2,451	2,439	0	12	19	2,420	0	-449	-449
5036	Cooper, C.	482	503	851	851	0	0	40	811	0	+329	+308
5037	McCrea	2,315	2,907	3,007	3,007	0	0	171	2,836	0	+521	-71
5038	Graham, Ly.	2,698	1,608	1,992	1,992	0	0	7	1,985	0	-713	+377
5039	Sandhills	336	336	276	194	0	82	2	192	0	-144	-144
5040	Harral	1,255	1,255	1,122	1,122	0	0	77	1,045	0	-210	-210
5044	Isler	186	297	183	183	0	0	1	182	0	-4	-115
5047	Hilburn	314	314	496	481	0	15	5	476	0	+162	+162
5049	Clemmons & Erdmann	840	840	705	705	0	0	13	692	0	-148	-148
5051	Marley	2,713	2,882	3,301	3,202	0	99	68	3,134	0	+421	+252
5057	Tigner	228	228	368	368	0	0	16	352	0	+124	+124
5058	Lynch	555	528	621	621	0	0	38	583	0	+28	+55
5062	Garnsey	710	720	1,126	1,126	0	0	52	1,074	0	+364	+354
5065	Graham, A.	898	972	1,006	986	0	20	58	928	0	+30	-44
5066	Spears	406	406	732	732	0	0	33	699	0	+293	+293
5068	Malstrom	2,145	2,145	2,231	2,190	0	41	12	2,178	0	+33	+33
5069	VHV Cattle	2,601	1,785	2,373	2,373	0	0	48	2,325	0	-276	+540
5072	Watson	879	1,654	2,469	2,469	0	0	6	2,463	0	+1,584	+809
5073	Derrick, M.	521	521	794	794	0	0	3	791	0	+270	+270
5074	Barbe	1,050	1,050	1,686	1,686	0	0	6	1,680	0	+630	+630
5079	S & S Corp.	340	377	475	475	0	0	14	461	0	+121	+84
5082	Gomez	56	143	140	140	0	0	3	137	0	+81	-6
5083	Wilson	597	596	940	940	0	0	0	940	0	+343	+344
5084	Greenwood	1,412	1,683	1,998	1,998	0	0	6	1,992	0	+580	+309

(A) AUMs included in 7012. The preferences for allotments 7012 and 6049 are added together because they belong to the same ranch operation.
(B) AUMs included in 6044. Licensed use for allotments are added together because they all belong to the same ranch operation.
(C) AUMs included in 6045. Licensed use for allotments are added together because they all belong to the same ranch operation.
(D) 7037 and 7038 are added together because they are being run by one ranch operator.
* Note: Suitability refers only to domestic livestock use. All use is on a yearlong basis.

TABLE A-4

PRESENT USE, ANTICIPATED FUTURE FORAGE PRODUCTION, AND FORAGE ALLOCATIONS IN THE LONG-RUN (BY THE YEAR 2000)

(Source: Roswell District Files and Soil Survey: Chaves, Eddy, and Lea Counties)

Allotments		Present Use		Anticipated Future Forage Production				Anticipated Future Forage Allocation			Anticipated Change	
No.	Name	Average Licensed Use (AUMs)	Grazing Preference (AUMs)	Total (AUMs)	Suitable Lands* (AUMs)	Unsuitable Lands* (AUMs)	Excluded Lands* (AUMs)	Forage Allocation To Big Game (AUMs)	Forage Allocation To Live stock (AUMs)	Residual Forage From Unsuitable Lands* (AUMs)	From Licensed Use (AUMs)	From Preference (AUMs)
5085	Taylor & Medlin	1,068	1,068	1,206	1,206	0	0	17	1,189	0	+121	+121
5088	Derrick & Merritt	502	1,458	1,381	1,381	0	0	5	1,376	0	+874	-82
5090	Sams & Dean	540	540	529	529	0	0	1	528	0	-12	-12
5091	Derrick, R.	333	338	462	462	0	0	0	462	0	+129	+124
5092	Merritt, Wm.	588	1,106	1,029	1,029	0	0	5	1,024	0	+436	-82
6004	Warren	444	444	863	863	0	0	3	860	0	+416	+416
6006	Caswell	1,786	2,400	4,869	4,869	0	0	10	4,859	0	+3,073	+2,459
6008	Linam	1,300	1,785	997	997	0	0	11	986	0	-314	-799
6009	Scharbauer	2,902	3,512	4,182	4,182	0	0	62	4,120	0	+1,218	+608
6011	Smith, M.	2,155	2,832	1,776	1,776	0	0	16	1,760	0	-395	-1,072
6020	Berry	3,334	3,553	3,120	3,120	0	0	37	3,083	0	-251	-470
6021	Smith, Wm.	3,215	3,617	3,123	3,123	0	0	12	3,111	0	-104	-506
6027	Merchant	2,968	2,968	3,354	3,354	0	0	24	3,330	0	+362	+362
6029	Ward	1,151	1,151	893	893	0	0	6	887	0	-264	-264
6030	Deep Well	612	612	493	493	0	0	4	489	0	-123	-123
6033	Dinwiddie	2,919	3,420	5,148	5,148	0	0	2	5,146	0	+2,227	+1,726
6035	Madera, R.	1,613	1,791	2,836	2,836	0	0	2	2,834	0	+1,221	+1,043
6042	Dublin	804	804	1,002	1,002	0	0	0	1,002	0	+198	+198
6043	Beckham	2,141	2,343	3,746	3,746	0	0	0	3,746	0	+1,605	+1,403
6044	Madera, M.	1,916	660	576	556	20	0	0	556	20	+2,541	-104
6044	Madera, M.	(B)	2,304	3,901	3,901	0	0	0	3,901	0	(B)	+1,597
6045	Madera, M. & K.	1,777	905	1,509	1,509	0	0	3	1,506	0	+4,137	+601
6045	Madera, M. & K.	(C)	3,029	4,420	4,420	0	0	12	4,408	0	(C)	+1,379
6045	Madera, M. & K.	2,237	2,640	3,484	3,484	0	0	12	3,472	0	+1,235	+832
6046	McDonald	706	857	1,229	1,229	0	0	0	1,229	0	+523	+372
7003	Holeman	567	567	1,061	1,061	0	0	5	1,056	0	+489	+489
7004	Martin	1,262	1,806	4,488	4,488	0	0	24	4,464	0	+3,202	+2,658
7005	Johnson, G.	221	278	175	175	0	0	2	173	0	-48	-105
7006	Gissler	672	672	460	460	0	0	5	455	0	-217	-217
7008	Williams	2,740	2,819	5,245	5,245	0	0	34	5,211	0	+2,471	+2,392
7011	Netherlin	923	923	1,132	1,132	0	0	7	1,125	0	+202	+202
7012	Snyder, L.T.D.	21,141	(A)21,319	20,005	19,764	236	5	95	19,677	228	-1,464	(A)-1,262
7013	Slash X Ranch	7,365	10,200	14,120	14,120	0	0	56	14,064	0	+6,699	+3,864
7014	Stagner & Forehand	342	970	1,474	1,474	0	0	9	1,465	0	+1,123	+495
7015	Angell	1,507	1,507	4,096	4,096	0	0	16	4,080	0	+2,573	+2,573
7016	Fanning	1,134	1,215	1,483	1,469	14	0	11	1,459	13	+325	+244
7018	Clayton	377	420	1,135	1,122	12	1	8	1,115	11	+738	+695
7020	Spears, J.	1,933	2,362	4,813	4,813	0	0	26	4,787	0	+2,854	+2,425
7021	Campbell	1,959	2,274	3,031	3,031	0	0	28	3,003	0	+1,044	+729
7022	Key	6,332	6,324	12,484	12,449	35	0	72	12,379	33	+6,047	+6,055
7025	West	421	420	1,585	1,585	0	0	6	1,579	0	+1,158	+1,159
7026	Pue	418	564	758	758	0	0	3	755	0	+337	+191
7027	Smith	6,568	7,769	14,823	14,816	4	3	76	14,741	3	+8,173	+6,972
7028	Clark	1,174	1,173	2,036	2,036	0	0	17	2,019	0	+845	+846
7031	Grandi	2,766	2,789	7,586	7,586	0	0	40	7,546	0	+4,780	+4,757
7033	Mobley	1,309	1,953	3,957	3,957	0	0	31	3,926	0	+2,617	+1,973
7034	Greenwood	1,067	1,066	1,831	1,831	0	0	14	1,817	0	+750	+751
7035	J & M Farms	205	443	1,511	1,511	0	0	13	1,498	0	+1,293	+1,055
7037	Delaware	2,040	3,984	(D)	(D)	0	0	44	(D)	0	(D)	(D)
7038	Delaware	192	192	4,834	4,833	1	0	0	4,790	0	+2,558	+614
7039	Lindsay	2,957	2,957	4,892	4,867	0	25	30	4,837	0	+1,880	+1,880
7041	Johnson, W.	819	819	1,963	1,963	0	0	27	1,936	0	+1,117	+1,117
Subtotal 2		143,747	162,249	219,948	219,086	322	540	2,002	217,098	308	+73,351	+55,229
No Specific Grazing Systems												
5001	Sea Cattle	660	660	389	389	0	0	41	348	0	-312	-312
5002	Gainer	72	72	29	29	0	0	4	25	0	-47	-47
5003	N. Plains Land & Inv.	40	40	15	15	0	0	0	15	0	-25	-25
5004	Boone	768	768	439	439	0	0	3	436	0	-332	-332
5006	Van Eaton	48	48	11	11	0	0	0	11	0	-37	-37
5008	Van Eaton	410	490	376	367	9	0	18	351	7	-59	-139
5009	Marley	552	624	260	239	0	21	3	236	0	-316	-388
5011	Moorhead	516	516	209	209	0	0	5	204	0	-312	-312
5013	Goods, Inc.	384	384	199	184	0	15	2	182	0	-202	-202
5014	McDowell (East)	72	72	18	18	0	0	0	18	0	-54	-54

TABLE A-4
PRESENT USE, ANTICIPATED FUTURE FORAGE PRODUCTION, AND FORAGE ALLOCATIONS IN THE LONG-RUN (BY THE YEAR 2000)

(Source: Roswell District Files and Soil Survey: Chaves, Eddy, and Lea Counties)

Allotments		Present Use		Anticipated Future Forage Production				Anticipated Future Forage Allocation			Anticipated Change	
No.	Name	Average Licensed Use (AUMs)	Grazing Preference (AUMs)	Total (AUMs)	Suitable Lands* (AUMs)	Unsuitable Lands* (AUMs)	Excluded Lands* (AUMs)	Forage Allocation To Big Game (AUMs)	Forage Allocation To Live stock (AUMs)	Residual Forage From Unsuitable Lands* (AUMs)	From Licensed Use (AUMs)	From Preference (AUMs)
5015	Southard, F.	36	36	13	13	0	0	0	13	0	-23	-23
5016	Southard, T.	144	144	138	122	0	16	5	117	0	-27	-27
5017	Southard, J.	60	60	37	37	0	0	0	37	0	-23	-23
5022	Smith, H.	36	36	79	79	0	0	0	79	0	+43	+43
5023	White	212	212	177	177	0	0	8	169	0	-43	-43
5026	Faircloth	216	216	215	215	0	0	1	214	0	-2	-2
5027	Nuckols	144	144	63	50	0	13	1	49	0	-95	-95
5030	Jenkins	84	84	46	46	0	0	0	46	0	-38	-38
5031	Huston	243	243	210	210	0	0	0	210	0	-33	-33
5033	Cato	144	144	91	91	0	0	0	91	0	-53	-53
5035	Whitelakes	192	192	91	91	0	0	1	90	0	-102	-102
5039	Red Tank	16	16	9	9	0	0	0	9	0	-7	-7
5039	Sherman Cattle	80	80	46	46	0	0	0	46	0	-34	-34
5042	Glenn	108	108	68	68	0	0	0	68	0	-40	-40
5045	Caprock Ranch	316	316	146	146	0	0	11	135	0	-181	-181
5050	Clemmons & Erdmann	468	468	229	229	0	0	5	224	0	-244	-244
5052	Marley	12	12	9	9	0	0	0	9	0	-3	-3
5054	Irvin	84	84	133	133	0	0	4	129	0	+45	+45
5056	Graham, Li.	60	60	87	87	0	0	0	87	0	+27	+27
5059	Wilson	228	228	118	118	0	0	12	106	0	-122	-122
5060	Sallee	24	24	35	35	0	0	4	31	0	+7	+7
5061	Woods	43	48	83	83	0	0	0	83	0	+40	+35
5064	Lee	176	176	109	109	0	0	0	109	0	-67	-67
5070	Miles	60	60	54	54	0	0	2	52	0	-8	-8
5071	Glass	12	12	11	11	0	0	0	11	0	-1	-1
5081	Greer	138	178	115	115	0	0	4	111	0	-27	-67
5089	Medlin, B.	180	180	60	60	0	0	0	60	0	-120	-120
5093	Haley	12	20	4	4	0	0	0	4	0	-8	-16
6001	McCrory	12	12	10	10	0	0	0	10	0	-2	-2
6002	Field	5	5	7	7	0	0	3	4	0	-1	-1
6003	Taylor & Heidel	11	11	6	6	0	0	0	6	0	-5	-5
6010	Snyder, L.T.D.	96	96	51	51	0	0	1	50	0	-46	-46
6012	Sims	12	12	2	2	0	0	0	2	0	-10	-10
6013	Klein	78	78	40	40	0	0	0	40	0	-38	-38
6014	S & W Cattle	406	406	83	83	0	0	0	83	0	-323	-323
6015	Kornegay	300	300	72	72	0	0	0	72	0	-228	-228
6016	Terry	197	197	76	75	1	0	0	75	0	-122	-122
6017	Hill	236	236	39	39	0	0	0	39	0	-197	-197
6018	Turland	116	116	57	57	0	0	0	57	0	-59	-59
6019	Cooper, D.	269	269	67	67	0	0	1	66	1	-203	-203
6024	Wallach	23	23	10	10	0	0	0	10	0	-13	-13
6025	Robinson	526	526	239	239	0	0	2	237	0	-289	-289
6026	Robinson	180	180	127	127	0	0	0	127	0	-53	-53
6028	Brininstool, Wm.	252	252	79	79	0	0	0	79	0	-173	-173
6029	Ward	20	20	4	4	0	0	0	4	0	-16	-16
6031	Goins	158	158	73	73	0	0	0	73	0	-85	-85
6032	Winters	216	216	50	47	3	0	0	47	3	-169	-169
6034	Wylie	408	408	246	246	0	0	2	244	0	-164	-164
6035	Madera, R.	612	612	598	598	0	0	0	598	0	-14	-14
6036	Madera, R.	24	24	4	4	0	0	0	4	0	-20	-20
6041	Dinwiddie	48	48	84	82	2	0	0	82	2	+34	+34
6047	Deck	490	490	301	299	2	0	3	296	2	-194	-194
6048	Maddox	1,524	1,524	811	811	0	0	13	798	0	-726	-726
6049	Snyder, L.T.D. (Hart)	713	(C)	391	391	0	0	11	380	0	-333	(C)
6050	Hilburn	12	12	10	10	0	0	0	10	0	-2	-2
7001	Haven	176	264	50	50	0	0	2	48	0	-128	-216
7002	Karr	120	120	35	35	0	0	0	35	0	-85	-85
7009	Evans	96	96	37	37	0	0	2	35	0	-61	-61
7010	Solt	347	347	159	159	0	0	5	154	0	-193	-193
7017	Greenwood, H.	180	180	36	36	0	0	2	34	0	-146	-146
7023	Beker, Inc.	104	156	80	80	0	0	2	78	0	-26	-78
7024	Simpson	175	175	138	138	0	0	2	136	0	-39	-39

TABLE A-4
PRESENT USE, ANTICIPATED FUTURE FORAGE PRODUCTION, AND FORAGE ALLOCATIONS IN THE LONG-RUN (BY THE YEAR 2000)
(Source: Roswell District Files and Soil Survey: Chaves, Eddy, and Lea Counties)

Allotments		Present Use		Anticipated Future Forage Production				Anticipated Future Forage Allocation			Anticipated Change	
No.	Name	Average Licensed Use (AUMs)	Grazing Preference (AUMs)	Total (AUMs)	Suitable Lands* (AUMs)	Unsuitable Lands* (AUMs)	Excluded Lands* (AUMs)	Forage Allocation To Big Game (AUMs)	Forage Allocation To Live stock (AUMs)	Residual Forage From Unsuitable Lands* (AUMs)	From Licensed Use (AUMs)	From Preference (AUMs)
7029	Bond	210	210	158	158	0	0	0	158	0	-52	-52
7030	Tracy	84	84	33	33	0	0	0	33	0	-51	-51
Subtotal 3		15,486	15,118	8,684	8,602	17	65	185	8,419	15	-7,067	-7,079
Subtotal 1		74,652	104,399	143,078	142,798	15	265	927	141,872	14	+67,220	+37,473
Subtotal 2		143,747	162,249	219,948	219,086	322	540	2,002	217,098	308	+73,351	+55,229
Subtotal 3		15,486	15,118	8,684	8,602	17	65	185	8,419	15	-7,067	-7,079
GRANDTOTAL		233,885	281,766	371,710	370,486	354	870	3,114	367,389	337	+133,504	+85,623

(A) AUMs included in 7012. The preferences for allotments 7012 and 6049 are added together because they belong to the same ranch operation.
(B) AUMs included in 6044. Licensed use for allotments are added together because they all belong to the same ranch operation.
(C) AUMs included in 6045. Licensed use for allotments are added together because they all belong to the same ranch operation.
(D) 7037 and 7038 are added together because they are being run by one ranch operator.
* Note: Suitability refers only to domestic livestock use. All use is on a yearlong basis.

TABLE A - 5
LIVESTOCK EXCLOSURES
(Source: Roswell District Files)

Allot. No.	Allotment Name	Public Lands Excluded from Grazing Acres	(AUMs)
Existing AMP			
5046	Caprock Ranch	480	47
5053	Culp, C.	480	73
5075	Bogle	210	28
5077	Williams	800	117
Subtotal		1,970	265
Proposed Intensive Management			
5005	Denton	320	44
5010	Moorhead	160	22
5012	Moorhead	400	57
5018	Bilberry	160	12
5028	Bilbrey	160	20
5029	McCombs	160	15
5032	Davis	480	67
5034	Seeligson	65	12
5039	Sandhills	480	82
5047	Hilburn	160	15
5051	Marley	720	99
5065	Graham, A.	120	20
5068	Malstrom	320	41
7012	Snyder	50	5
7018	Clayton	40	1
7027	Smith	40	3
7039	Lindsay	40	25
Subtotal		3,875	540
Proposed Nonintensive Management			
5009	Marley	240	21
5013	Goods, Inc.	160	15
5016	Southard, T.	160	16
5027	Nuckols	160	13
Subtotal		720	65
GRAND TOTAL		6,565	870

TABLE A-6
LIVESTOCK EXCLUSIONS, BY ALLOTMENT FOR BROADLEAF TREE AND PLAYA PROTECTION, AND PROPOSED DIRT TANK DEVELOPMENTS

(Source: Renwald 1979 and Roswell District URA Files)

BROADLEAF TREE PROTECTION EXCLOSURES

Allotment Number	Tree Location
5075	T. 15 S., R. 27 E., Sec. 27: SW 1/4
5075	T. 15 S., R. 27 E., Sec. 11: SW 1/4
5075	T. 15 S., R. 28 E., Sec. 14: SW 1/4
6007	T. 18 S., R. 33 E., Sec. 9: SW 1/4
7008	T. 17 S., R. 30 E., Sec. 34: NW 1/4
7008	T. 17 S., R. 31 E., Sec. 6: NW 1/4
7012	T. 20 S., R. 31 E., Sec. 31: NE 1/4
7013	T. 20 S., R. 31 E., Sec. 35: NE 1/4
7015	T. 20 S., R. 28 E., Sec. 4: NE 1/4
7022	T. 21 S., R. 30 E., Sec. 6: SE 1/4
7022	T. 21 S., R. 30 E., Sec. 20: SE 1/4
7025	T. 21 S., R. 28 E., Sec. 29: NE 1/4
7028	T. 21 S., R. 28 E., Sec. 33: SW 1/4
7034	T. 23 S., R. 29 E., Sec. 13: SW 1/4
7037	T. 25 S., R. 29 E., Sec. 33: NW 1/4
7037	T. 25 S., R. 29 E., Sec. 29: SW 1/4
7040	T. 26 S., R. 31 E., Sec. 29: NE 1/4

PLAYA PROTECTION EXCLOSURES

Allotment Number	Playa Location
5075	T. 15 S., R. 29 E., Sec. 11: NW 1/4
5075	T. 16 S., R. 28 E., Sec. 15: SW 1/4
6033	T. 26 S., R. 28 E., Sec. 18: SE 1/4
6044	T. 25 S., R. 35 E., Sec. 12: NE 1/4
6040	T. 34 S., R. 34 E., Sec. 19: NW 1/4
7013	T. 19 S., R. 30 E., Sec. 26: NE 1/4
7037	T. 25 S., R. 29 E., Sec. 1: NW 1/4

PROPOSED DIRT TANK DEVELOPMENTS (EXCLOSURES)

Allotment Number	Dirt Tank Location
5062	T. 11 S., R. 26 E., Sec. 25: SW 1/4
5066	T. 12 S., R. 31 E., Sec. 21: NE 1/4
5069	T. 31 S., R. 27 E., Sec. 14: NW 1/4
5075	T. 15 S., R. 29 E., Sec. 14: SE 1/4
5075	T. 16 S., R. 31 E., Sec. 9: SW 1/4
5075	T. 16 S., R. 30 E., Sec. 25: NW 1/4
5075	T. 16 S., R. 27 E., Sec. 19: SW 1/4
5075	T. 16 S., R. 27 E., Sec. 15: NW 1/4
5075	T. 16 S., R. 27 E., Sec. 22: NE 1/4
5075	T. 17 S., R. 30 E., Sec. 6: NW 1/4
5075	T. 18 S., R. 29 E., Sec. 18: SW 1/4
6020	T. 21 S., R. 32 E., Sec. 13: NW 1/4
6028	T. 23 S., R. 32 E., Sec. 36: NW 1/4
7006	T. 18 S., R. 27 E., Sec. 8: SW 1/4
7013	T. 20 S., R. 31 E., Sec. 7: NW 1/4
7015	T. 20 S., R. 28 E., Sec. 4: NE 1/4
7016	T. 19 S., R. 27 E., Sec. 34: NW 1/4
7018	T. 20 S., R. 27 E., Sec. 13: SW 1/4
7020	T. 21 S., R. 27 E., Sec. 14: NE 1/4
7022	T. 21 S., R. 28 E., Sec. 9: SE 1/4
7022	T. 21 S., R. 28 E., Sec. 14: SW 1/4
7022	T. 21 S., R. 29 E., Sec. 17: NE 1/4
7027	T. 22 S., R. 30 E., Sec. 30: NE 1/4
7031	T. 22 S., R. 28 E., Sec. 20: NE 1/4
7032	T. 21 S., R. 32 E., Sec. 26: SE 1/4
7033	T. 23 S., R. 30 E., Sec. 8: NE 1/4
7037	T. 25 S., R. 29 E., Sec. 9: SE 1/4
7037	T. 25 S., R. 29 E., Sec. 3: NW 1/4
7040	T. 26 S., R. 31 E., Sec. 26: SE 1/4
7040	T. 26 S., R. 31 E., Sec. 21: SE 1/4
7040	T. 25 S., R. 31 E., Sec. 33: SW 1/4
7040	T. 25 S., R. 30 E., Sec. 24: SW 1/4

TABLE A-7
EXISTING AND PROPOSED BRUSH CONTROL TREATMENTS AND LIVESTOCK FACILITIES
(Source: Roswell District Files)

		EXISTING BRUSH CONTROL PROJECTS			PROPOSED BRUSH CONTROL PROJECTS				EXISTING FACILITIES				PROPOSED FACILITIES	
Allot. No.	Name	Chemical Acres	Mechanical Ac.	Mechanical Total	Chemical Acres	Mechanical Acres	Total Acres	Control Burnings Ac.	Waters (Ea.)	Fence (Miles)	Cattle Guards (Each)	Corrales (Ea.)	Waters (Ea.)	Fences (Miles)
Existing Specific Grazing Systems														
5043	Sand Ranch				891		891		4	16.9	4			
5046	Caprock Ranch								6	19.3	3	1		4
5053	Culp, C.	640	0	640	1,280		1,280		13	25.1		2		3
5063	Culp, J.	1,107	0	1,107	280		280		2	12.4			1	
5075	Bogle	1,280	0	1,280	117,649		117,649		28	217.0	57	4	21	27.5
5077	Williams, P.	5,967	0	5,967	1,645		1,645		11	26.0	1		2	6
5078	Slash ML Ranch				1,280		1,280		7	14.0	1		1	
6007	Caviness				12,444		12,444		6	40.4	16	3	5	
6022	Bingham	1,920	0	1,920	2,725		2,725		3	15.7	2	1		
6028	Brininstool, W.	3,840	0	3,840	12,109		12,109		10	27.4	9	1		
6037	Diamond & Half, Inc.				24,543		24,543		10	25.0				
6038	James	7,740	0	7,740	25,316		25,316		14	69.6	17	2	1	
6039	Robbins	4,977	0	4,977	6,310		6,310		5	25.2	17	1	2	
6040	Brininstool, C.	6,588	0	6,588	6,751		6,751		7	19.5	4	3		
7007	Haines				2,170		2,170		3	11.3	7	2	1	
7019	Rains				4,551		4,551		2	19.0	6		1	
7032	Sanders	25,480	0	25,480	66,211		66,211		28	106.5				
7036	Madera & McDonald				18,156		18,156		13	21.9	4	2	6	
7040	Jackson				49,587		49,587		23	64.7	11	3	7	
7042	Twinwells	22,560	0	22,560	36,224		36,224		7	60.9	12	3	8	
Subtotals		82,099	0	82,099	390,122		390,122		202	837.8	171	28	56	40.5
Proposed Specific Grazing Systems														
5005	Denton	2,137	0	2,137					4	11.4	1			4.5
5007	Cooper, M.				2,681		2,681			6.5			1	
5010	Moorhead									7.8				1.5
5012	Moorhead								2	9.8				4.0
5014	McDowell (West)								1	9.95			1	1.0
5018	Bilberry								3	9.0			1	1.0
5019	Cooper, M.				3,597		3,597		2	7.6				
5020	Sturgeon				4,538		4,538		2	10.5			1	2.0
5021	Wagner				3,786		3,786		7	9.6			2	
5024	Durham				3,292		3,292			7.3	1		2	3.0
5025	Marley				4,507		4,507			13.1			3	2.0
5028	Bilbrey	6,030	0	6,030	1,360	280	1,640		5	19.3	1			1.5
5029	McCombs	1,050	0	1,050					1	8.4	4		2	3.0
5032	Davis	7,256	0	7,256					2	14.7	3	1		3.0
5034	Seeligson				3,980	160	4,140		4	24.9	2	1	5	
5036	Cooper, C.				3,111		3,111		3	7.0				1.0
5037	McCrea				6,102		6,102		7	17.4	1		6	1.0
5038	Graham, Ly.				7,658		7,658		1	7.9				
5039	Sandhills								1	4.5				4.0
5040	Harral								1	12.7			2	
5044	Isler									4.8	1		1	
5047	Hilburn								1	9.3				1.5
5049	Clemmons & Erdmann								3	14.3				1.5
5051	Marley				440		440		9	28.5	1		2	5.0
5057	Tigner							520		5.6			2	
5058	Lynch								1	8.8	1		1	
5062	Garnsey				1,258		1,258		2	19.5				.5
5065	Graham, A.				365		365		1	12.5			2	3.5
5066	Spears				1,690		1,690		2	6.3				
5068	Malstrom				2,920		2,920		2	27.6			1	2.0
5069	VHV Cattle				5,310		5,310		4	13.7	1		2	
5072	Watson				7,950		7,950		2	11.6			5	
5073	Derrick, M.				1,600		1,600			6.0			1	
5074	Barbe				1,880		1,880		2	15.3			4	1.0
5079	S & S Corp.				1,547		1,547		1	4.8			1	1.0
5082	Gomez				559		559			2.7			2	
5083	Wilson				2,975		2,975		3	6.4	2		1	
5084	Greenwood				7,709		7,709		1	14.0	6		3	4.0
5085	Taylor & Medlin				3,194		3,194			10.25			1	1.5
5088	Derrick & Merritt				3,640		3,640		1	9.5			3	1.75
5090	Sams & Dean				1,020		1,020			7.5	1		2	
5091	Derrick, R.				1,430		1,430			15.8			1	
5092	Merritt, Wm.				3,604		3,604		1	11.7	1		1	2.5
6004	Warren				3,016		3,016			9.0				
6006	Caswell				17,649		17,649		11	21.1	4			6.5
6008	Linam				20		20		7	36.15	12	4	2	

TABLE A-7
EXISTING AND PROPOSED BRUSH CONTROL TREATMENTS AND LIVESTOCK FACILITIES
(Source: Roswell District Files)

		EXISTING BRUSH CONTROL PROJECTS			PROPOSED BRUSH CONTROL PROJECTS				EXISTING FACILITIES				PROPOSED FACILITIES	
Allot. No.	Name	Chemical Acres	Mechanical Ac.	Mechanical Total	Chemical Acres	Mechanical Acres	Total Acres	Control Burnings Ac.	Waters (Ea.)	Fence (Miles)	Cattle Guards (Each)	Corrales (Ea.)	Waters (Ea.)	Fences (Miles)
6009	Scharbauer				5,020		5,020		6	19,3	4		1	3.5
6011	Smith, M.				790		790		7	28,0	9		1	2.0
6020	Berry				6,662		6,662		3	30,5	7	2	5	5.5
6021	Smith, Wm.	7,240	0	7,240	9,279		9,279		8	43,4	7	3		
6027	Merchant	320	0	320	10,165		10,165			12,8	2	1	2	
6029	Ward				1,200		1,200		1	17.3	2	1	2	4.0
6030	Deep Well				1,235		1,235			10.5			1	
6033	Dinwiddie	1,930	0	1,930	16,750		16,750		8	38.0			1	
6035	Madera, R.				8,716		8,716		1	18.5			1	
6042	Dublin				4,180		4,180		2	16.3	3		3	
6043	Beckham				12,906		12,906		4	16.0			3	8.75
6044	Madera, M.				2,080		2,080			12.9	2		2	1.0
6044	Madera, M.				13,307		13,307		2	23.5	2		3	2.5
6045	Madera, M. & K.				4,768		4,768			8.5	2		1	2.0
6045	Madera, M. & K.				14,801		14,801		2	27.5	18		4	
6045	Madera, M. & K.	440	0	440	10,369		10,369		1				4	9.0
6046	McDonald				5,011		5,011		2	9.5	2		2	2.5
7003	Holeman				3,202		3,202		2	7.5	2			
7004	Martin				13,570		13,570		2	19.0			3	9.0
7005	Johnson, G.				200		200		1	3.4	4	2	1	
7006	Gissler				708		708		3	13.1	3		1	
7008	Williams				15,126		15,126		6	29.0	22	2	1	4.0
7011	Netherlin				3,413		3,413		3	10.8	3	1	2	1.3
7012	Snyder, L.T.D.				38,980		38,980		23	110.2	25	7	24	
7013	Slash X Ranch	10,280	0	10,280	40,402		40,402		11	85.0	12	4		
7014	Stagner & Forehand				2,350		2,350			15.5	4		1	1.5
7015	Angel				9,862		9,862		12	19.0	6		2	3.5
7016	Fanning				3,631		3,631		15	22.6	4	2	2	4.5
7018	Clayton				2,925		2,925		3	13.3	5	1	1	
7020	Spears, J.				12,122		12,122		7	25.9	1		3	5.5
7021	Campbell				9,876		9,876		7	29.7	2		1	
7022	Key				36,269		36,269		3	92.0			12	
7025	West				5,217		5,217		1	11.5	2		1	2.5
7026	Pue				2,745		2,745			9.0			2	1.8
7027	Smith, K.	6,800	0	6,800	44,122		44,122		10	46.6	12		9	9.5
7028	Clark				7,233		7,233		3	22.3	4			
7031	Grandi				21,095		21,095		3				2	3.5
7033	Mobley				11,699		11,699		1	15.5			3	1.5
7034	Greenwood				4,854		4,854			16.2			3	
7035	J & M Farms				4,153		4,153			13.9		1	1	
7037	Delaware)				14,044		14,044		4	93.0			2	
7038	Delaware)				*		*		*				*	
7039	Lindsay				14,083		14;083		3				2	
7041	Johnson, W.				7,294		7,294		1	9.0			4	
Subtotal		43,483	0	43,483	570,802	440	571,242	520	271	1,617.55	214	33	183	153.6
No Specific Grazing System														
5001	Sea Cattle									7.8				
5002	Gainer									1.2				
5003	N. Plains Land & Inv.								1					
5004	Boone								3	54.8				
5006	Van Eaton									1.0				
5008	Van Eaton									7.29		1		
5009	Marley								4	13.15				4.0
5011	Moorhead								2	4.6				
5013	Goods, Inc.								3	9.7				1.5
5014	McDowell (East)									.5				
5015	Southard, F.									1.5	2			
5016	Southard, T.	410	0	410						2.0	2			1.0
5017	Southard, J.									1.5				
5022	Smith, H.													
5023	White									4.54	2	2		
5026	Faircloth									3.09				
5027	Nuckols									2.55				1.0
5030	Jenkins									1.5	1			
5031	Huston									2.1	2			
5033	Cato									3.9	2			
5035	Whitelakes									1.45				
5039	Red Tank									1.0				
5039	Sherman Cattle									.3				

*Figures for 7038 are included in 7037 because ranch is run by one operator.

TABLE A-7
EXISTING AND PROPOSED BRUSH CONTROL TREATMENTS AND LIVESTOCK FACILITIES
(Source: Roswell District Files)

		EXISTING BRUSH CONTROL PROJECTS			PROPOSED BRUSH CONTROL PROJECTS				EXISTING FACILITIES				PROPOSED FACILITIES	
			Mechanical											
Allot. No.	Name	Chem-ical Acres	Ac.	Total	Chem-ical Acres	Me-chan-ical Acres	Total Acres	Con-trol Burn-ings Ac.	Wat-ers (Ea.)	Fence (Miles)	Cattle Guards (Each)	Cor-rales (Ea.)	Wat-ers (Ea.)	Fences (Miles)
5042	Glenn									3.5				
5045	Caprock Ranch													
5050	Clemmons & Erdmann													
5052	Marley													
5054	Irvin									2.8				
5056	Graham, I.									1.25				
5059	Wilson								2	3.56	1	1		
5060	Sallee									1.3				
5061	Woods									.25				
5064	Lee									.5				
5070	Miles									3.0				
5071	Glass													
5081	Greer									4.65				
5089	Medlin, B.									2.0				
5093	Haley													
6001	McCrory													
6002	Field													
6003	Taylor & Heidel													
6010	Snyder, L.T.D.									.25				
6012	Sims													
6013	Klein									1.0				
6014	S & W Cattle									3.6	4			
6015	Kornegay									4.4	4			
6016	Terry									1.5				
6017	Hill								1.0	1.36	2			
6018	Turland									3.0	1			
6019	Cooper, D.									2.5	3			
6024	Wallach									.25				
6025	Robinson									9.0	8	1		
6026	Robinson									2.0	1			
6028	Brininstool, Wm.									2.0				
6029	Ward									1.0				
6031	Goins									2.5				
6032	Winters									2.5				
6034	Wylie													
6036	Madera, R.													
6041	Dinwiddie									1.0				
6047	Deck									3.75	4			
6048	Maddox									11.75	1			
6049	Snyder, L.T.D. (Hart)								2	14.25	7	1	1	
6050	Hilburn													
7001	Haven									2.54			1	
7002	Karr									3.27	1			
7009	Evans													
7010	Solt								1	9.5	8		1	
7017	Greenwood, H.									3.0			1	
7023	Beker, Inc.									11.0			1	.25
7024	Simpson									12.0			1	.75
7029	Bond								1	5.25	1		1	
7030	Tracy								1					
Subtotal		410	0	410		0	0	0	21	262.45	57	6	7	8.5
Subtotal 1		82,099	0	82,099	390,122	0	390,122		202	837.8	171	28	56	40.5
Subtotal 2		43,483	0	43,483	570,802	440	571,242	520	271	1,617.55	214	33	183	153.6
Subtotal 3		410	0	410	0	0	0	0	21	262.45	57	6	7	8.5
GRANDTOTAL		125,992	0	125,992	960,924	440	961,364	520	494	2,717.8	442	67	246	202.60

TABLE A-8
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
(Source: Roswell District Files and Soil Surveys Chaves, Eddy, and Lea Counties)

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production: Brush Treatment[b]		Potential Production: No Brush Treatment[c]		Potential Production: Grassland[d]		Total Potential AUMs	Total Existing AUMs[e]
				Acres	AUMs	Acres	AUMs	Acres	AUMs		
	Existing Specific Grazing Systems										
5043	Sand Ranch	CP-2									
	Deep Sand		3,276	74	18	3,202	316			334	
	Sandy		714	680	227	34	8			235	
	Sand Hills		4,326	137	34	4,189	499			533	
	Limey		66			66	8			8	
	Shallow		13			13	1			1	
	Total		8,395	891	279	7,504	832			1,111	987
5046	Caprock Ranch	CP-2									
	Deep Sand		4,375			4,375	334			334	
	Sandy		196			196	17			17	
	Sand Hills		5,056			5,056	486			486	
	Limey		196			196	7			7	
	Total		9,823			9,823	844			844	844
5053	Culp, C.	SD-3									
	Sandy		150	150	50	0	0			50	
	Limey		60	60	20	0	0			20	
	Deep Sand	CP-2	8,973	1,004	251	8,019	1,080			1,331	
	Sand Hills		8,449	46	11	8,353	1,267			1,278	
	Active Duneland[f]		50	20	0	30	0				
	Total		17,682	1,280	332	16,402	2,347			2,679	2,512
5063	Culp, J.	CP-2									
	Deep Sand		754	14	4	740	38			42	
	Sandy		240	0	0	240	44			44	
	Bottom land		510	240	240	270	63			303	
	Sand Hills		1,400	26	7	1,374	165			172	
	Shallow		40			40	6			6	
	Total		2,944	280	251	2,664	316			567	359
5075	Bogle	SD-3									
	Deep Sand		37,731	21,133	7,044	16,598	1,196			8,240	
	Sandy		30,639	21,882	7,294	8,757	2,113			9,407	
	Bottomland		6,761	6,556	3,278	205	1			3,279	
	Limestone Hills		40	40	10					10	
	Loamy		24,782	18,357	4,589	1,510	552	4,915	1,229	6,370	
	Gyp Breaks-Hills		1,060	640	71	420	1			72	
	Gyp Uplands		17,711	10,786	1,540	1,928	184	4,997	714	2,438	
	Sand Hills		18,005	1,537	512	16,468	1,104			1,616	
	Gravelly		15,264	13,382	3,345	296	92	1,586	396	3,833	
	Loamy Sand		7,599	6,690	1,672	909	92			1,764	
	Salt Flats		7,520			7,520	0				
	Active Duneland[f]		439			439	0				
	Rocky Land[f]		1,760			1,760	0				
	Shallow Sand		14,356	12,166	4,055	2,190	184			4,239	
	Deep Sand	CP-2	17,700	370	92	17,330	1,196			1,288	
	Sandy		11,191	4,020	1,340	7,171	828			2,168	
	Sand Hills		16,359	90	22	16,269	1,472			1,494	
	Gravelly		558			558	92			92	
	Loamy Sand		702			702	92			92	
	Active Duneland[f]		100			100	0				
	Shallow Sand		225			225	1			1	
	Total		230,502	117,649	34,864	101,355	9,200	11,498	2,339	46,403	22,325
5077	Williams	CP-2									
	Sandy		3,190	1,590	530	1,600	263			793	
	Deep Sand		7,007	40	10	6,967	699			709	
	Sand Hills		8,631	15	5	8,616	1,062			1,067	
	Total		18,828	1,645	545	17,183	2,024			2,569	2,107
5078	Slash ML Ranch	CP-2									
	Deep Sand		2,947	891	223	2,056	160			383	
	Sandy		680	330	110	350	43			153	
	Sand Hills		2,427	59	14	2,368	230			244	
	Total		6,054	1,280	347	4,774	433			780	584
6007	Caviness	SD-3									
	Deep Sand		8,780	6,523	2,174	2,257	176			2,350	
	Sandy		2,845	1,595	532	1,250	144			676	
	Sand Hills		6,494	3,696	1,232	2,798	208			1,435	
	Gravelly		80	40	10	40	5			15	
	Loamy Sand		50	50	13					18	
	Active Duneland[f]		670	540	0	130	0			0	
	Total		18,919	12,444	3,961	6,475	533			4,494	1,688

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[a] Range sites are listed by SCS major land resource areas (MLRA): SD3 = Southern Desert, CP 2 = Pecos-Canadian Plains and Valleys, HP3 = Southern High Plains.

[b] Brush removal and proper management; forage production would approximate SCS projection for that range site in excellent condition by year 2000.

[c] Forage production by year 2000 should approximate existing production levels. However, without brush control, production would be declining after year 2000.

[d] Grasslands with proper management should recover to SCS projection for that range site in excellent condition by year 2000.

[e] Data is from 1977 Range Survey.

[f] Designates land types.

TABLE A-8
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
(Source: Roswell District Files and Soil Surveys Chaves, Eddy, and Lea Counties)

				Potential Production							
				Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]			
Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Acres	AUMs	Acres	AUMs	Acres	AUMs	Total Potential AUMs	Total Existing AUMs[e]
6022	Bingham	SD-3									
	Sandy		441	441	147					147	
	Gravelly		1,885	1,885	471					471	
	Loamy Sand		399					399	99	99	
	Waste[f]		540	399	0	141	0				
	Total		3,265	2,725	618	141	0	399	99	717	341
6028	Brininstool, W.	SD-3									
	Deep Sand		11,031	11,031	3,677					3,677	
	Sandy		515	515	171					171	
	Sand Hills		563	563	187					187	
	Total		12,109	12,109	4,035					4,035	1,064
6037	Diamond & Half, Inc.	SD-3									
	Deep Sand		14,132	14,132	4,710					4,710	
	Sandy		2,734	2,734	911					911	
	Sand Hills		1,392	1,392	464					464	
	Gravelly		4,298	4,298	1,074					1,074	
	Active Duneland[f]		1,633	1,633	0					0	
	Limey		354	354	118					118	
	Total		24,543	24,543	7,277					7,277	3,409
6038	James	SD-3									
	Deep Sand		18,770	18,770	6,256					6,256	
	Sandy		4,723	4,723	1,574					1,574	
	Sand Hills		1,218	1,218	406					406	
	Gravelly		390	390	97					97	
	Active Duneland[f]		215	215	0					0	
	Total		25,316	25,316	8,333					8,333	5,095
6039	Robbins	SD-3									
	Deep Sand		5,560	3,180	1,060	2,380	239			1,299	
	Sandy		1,139	860	286	279	38			324	
	Sand Hills		88			88	8			8	
	Gravelly		1,351	800	200	551	68			268	
	Loamy Sand		155			155	23			23	
	Hills & Breaks		630	30	0	600	0			0	
	Active Duneland[f]		1,575	1,440	0	135	0			0	
	Total		10,498	6,310	1,546	4,188	376			1,922	1,080
6040	Brininstool, C.	SD-3									
	Deep Sand		4,307	4,307	1,435					1,435	
	Sandy		255	255	85					85	
	Sand Hills		280	280	93					93	
	Gravelly		150	150	37					37	
	Active Duneland[f]		1,759	1,759	0					0	
	Total		6,751	6,751	1,650					1,650	752
7007	Haines	SD-3									
	Deep Sand		2,321	918	306	1,403	175			481	
	Sandy		550	520	173	30	6			179	
	Sand Hills		1,848	732	244	1,116	125			369	
	Total		4,719	2,170	723	2,549	306			1,029	446
7019	Rains	SD-3									
	Deep Sand		397	397	132					132	
	Sandy		1,655	1,547	515			108	36	551	
	Loamy		1,416	450	112			966	241	353	
	Gyp Upland		2,945	2,139	305			806	115	420	
	Sand Hills		18	18	6					6	
	Total		6,431	4,551	1,070			1,880	392	1,462	326
7032	Sanders	SD-3									
	Deep Sand		42,105	42,105	14,035					14,035	
	Sandy		7,138	7,138	2,379					2,379	
	Bottomland		512	512	256					256	
	Sand Hills		12,045	12,045	4,015					4,015	
	Gravelly		852	852	213					213	
	Loamy Sand		85	85	21					21	
	Hills & Breaks		100	100	0					0	
	Active Duneland[f]		3,320	3,320	0					0	
	Limey		54	54	18					18	
	Total		66,211	66,211	20,937					20,937	8,694
7036	Madera & McDonald	SD-3									
	Deep Sand		8,143	8,143	2,714					2,714	
	Sandy		2,970	2,970	990					990	
	Bottomland		44	44	22					22	
	Loamy		485	485	121					121	
	Gyp Uplands		30	30	4					4	
	Sand Hills		5,168	5,168	1,722					1,722	
	Gravelly		1,316	1,316	329					329	
	Hills & Breaks		830			830	0			0	
	Rocky Lands[f]		110			110	0			0	
	Total		19,096	18,156	5,902	940	0			5,902	1,813

TABLE A-8
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
(Source: Roswell District Files and Soil Surveys Chaves, Eddy, and Lea Counties)

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production Brush Treatment[b] Acres	 Brush Treatment[b] AUMs	 No Brush Treatment[c] Acres	 No Brush Treatment[c] AUMs	 Grassland[d] Acres	 Grassland[d] AUMs	Total Potential AUMs	Total Existing AUMs[e]
7040	Jackson	SD-3									
	Deep Sand		17,153	16,135	5,378	1,018	162			5,540	
	Sandy		21,745	21,745	7,247					7,247	
	Bottomland		7,265	7,265	3,632					3,632	
	Gyp Uplands		108	108	15					15	
	Sand Hills		70	70	23					23	
	Gravelly		6,734	3,914	978	2,820	485			1,463	
	Hills & Breaks		350	350	0					0	
	Total		53,425	49,587	17,273	3,838	647			17,920	5,525
7042	Twin Wells	SD-3									
	Deep Sand		23,646	23,625	7,875	21	0			7,875	
	Sandy		9,441	8,663	2,887	778	88			2,975	
	Bottomland		1,704	1,704	852					852	
	Sand Hills		1,974	1,944	648	30	0			648	
	Gravelly		680	288	72	392	25			97	
	Total		37,445	36,224	12,334	1,221	113			12,447	4,362
Subtotal Existing Systems			582,956	390,122	122,277	179,057	17,971	13,777	2,830	143,078	64,313
Proposed Specific Grazing Systems											
5005	Denton	CP-2									
	Deep Sand		3,359			2,064	151	1,295	431	582	
	Sandy		1,368			998	108	370	123	231	
	Loamy		62			62	6			6	
	Sand Hills		1,430			1,245	84	185	61	145	
	Shallow		2			2	0			0	
	Total		6,221			4,371	349	1,850	615	964	722
5007	Cooper, M.	CP-2									
	Deep Sand		84	84	21					21	
	Sandy		1,742	1,742	581					581	
	Loamy		54	54	18					18	
	Gyp Uplands		85	85	10					10	
	Gravelly		198	198	49					49	
	Loamy Sand		85	85	28					28	
	Hills & Breaks		142	47	0	95	0			0	
	Shallow		36	36	9					9	
	Riparian[f]		100			100	30			30	
	Bottomland	SD-3	60	60	30					30	
	Gyp Breaks - Hills		290	290	32					32	
	Total		2,876	2,681	778	195	30			808	555
5010	Moorhead	CP-2									
	Deep Sand		1,413			1,413	151			151	
	Sand Hills		1,065			1,065	142			142	
	Total		2,478			2,478	293			293	293
5012	Moorhead	CP-2									
	Deep Sand		2,547			2,367	357	180	45	402	
	Sandy		190			190	39			39	
	Sand Hills		988			988	144			144	
	Limey		38			38	6			6	
	Shallow		38			38	6			6	
	Total		3,801			3,621	552	180	45	597	575
5014	McDowell - West	CP-2									
	Deep Sand		831			831	50			50	
	Sandy		744			744	72			72	
	Sand Hills		273			273	16			16	
	Shallow		42			42	3			3	
	Total		1,890			1,890	141			141	141
5018	Bilberry	CP-2									
	Deep Sand		1,511			1,511	114			114	
	Sand Hills		2,057			2,057	188			188	
	Sandy	HP-3	280			280	33			33	
	Loamy		3			3	0			0	
	Shallow		7			7	0			0	
	Total		3,858			3,858	335			335	335
5019	Cooper, M.	CP-2									
	Deep Sand		1,366	1,366	341					341	
	Sandy		1,281	1,281	427					427	
	Gravelly		586	586	146					146	
	Hills & Breaks		364	364	0					0	
	Total		3,597	3,597	914					914	576

TABLE A-8
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
(Source: Roswell District Files and Soil Surveys Chaves, Eddy, and Lea Counties)

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production						Total Potential AUMs	Total Existing AUMs[e]
				Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]			
				Acres	AUMs	Acres	AUMs	Acres	AUMs		
5020	Sturgeon	SD-3									
	Bottomland		500	475	238	25	0			238	
	Gyp Breaks-Hills		1,220	1,220	135					135	
	Riparian[f]		260	250	0	10	0			0	
	Deep Sand	CP-2	152	152	38					38	
	Sandy		1,654	1,614	538	40	0			538	
	Gravelly		480	480	120					120	
	Hills & Breaks		320	320	0					0	
	Shallow		27	27	0					0	
	Total		4,613	4,538	1,069	75	0			1,069	627
5021	Wagner	CP-2									
	Deep Sand		1,221	1,221	305					305	
	Sandy		1,615	1,615	538					538	
	Loamy		500	500	167					167	
	Sand Hills		319	319	80					80	
	Gravelly		78	78	19					19	
	Hills & Breaks		53	53	0					0	
	Total		3,786	3,786	1,109					1,109	716
5024	Durham	SD-3									
	Bottomland		70	70	35					35	
	Gyp Breaks-Hills		90	70	8			20	11	19	
	Deep Sand	CP-2	300	174	43			126	71	114	
	Sandy		1,662	1,548	516			114	64	580	
	Loamy		585	573	191			12	7	198	
	Gyp Upland		877	857	107			20	10	117	
	Total		3,584	3,292	900			292	163	1,063	1,063
5025	Marley	SD-3									
	Gyp Upland		380	200	28			180	36	64	
	Loamy Sand		380	269	67			111	38	105	
	Deep Sand	CP-2	952	952	238					238	
	Sandy		1,203	1,203	401					401	
	Loamy		174	174	58					58	
	Gyp Upland		108	108	13					13	
	Gravelly		342	342	85					85	
	Loamy Sand		592	592	197					197	
	Hills & Breaks		158	158	0					0	
	Limey		376	376	125					125	
	Shallow		133	133	0					0	
	Total		4,798	4,507	1,212			291	74	1,286	1,286
5028	Bilbrey	CP-2									
	Deep Sand		3,318	610	153	2,708	243			396	
	Sandy		1,450	928	309	140	23	382	127	459	
	Loamy		102	102	34	0				34	
	Limey		30	0	0	0		30	10	10	
	Shallow		1,930	0	0	1,930	492			492	
	Total		6,830	1,640	496	4,778	758	412	137	1,391	950
5029	McCombs	CP-2									
	Deep Sand		1,641			1,641	244			244	
	Sandy		129			129	22			22	
	Sand Hills		1,150			1,150	170			170	
	Limey		11			11	1			1	
	Total		2,931			2,931	437			437	437
5032	Davis	HP-3									
	Deep Sand		810			810	91			91	
	Sandy		30			30	5			5	
	Limey		210			210	32			32	
	Deep Sand	CP-2	3,808			3,808	438			438	
	Sandy		433			433	78			78	
	Sand Hills		3,188			3,188	448			488	
	Total		8,479			8,479	1,092			1,092	1,092
5034	Seeligson	CP-2									
	Deep Sand		4,236	1,213	303	3,023	343			646	
	Sandy		2,728	1,444	481	880	155	404	135	771	
	Sand Hills		4,418	651	162	3,767	531			693	
	Limey		236	88	29			148	49	78	
	Shallow		1,244	744	186	500	66			252	
	Sandy Loam		60			60	11			11	
	Total		12,922	4,140	1,161	8,230	1,106	552	184	2,451	1,563
5036	Cooper, C.	CP-2									
	Sandy		1,042	1,042	357					357	
	Loamy		560	560	196					196	
	Gyp Upland		408	408	51					51	
	Gravelly		150	150	37					37	
	Hills & Breaks		100	100	0					0	
	Shallow		361	361	100					100	

TABLE A-8
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
(Source: Roswell District Files and Soil Surveys Chaves, Eddy, and Lea Counties)

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production						Total Potential AUMs	Total Existing AUMs[e]
				Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]			
				Acres	AUMs	Acres	AUMs	Acres	AUMs		
5036	Cooper, C. (continued)										
	Sandy	SD-3	15	15	5					5	
	Loamy		6	6	1					1	
	Gyp Breaks-Hills		70	70	7					7	
	Gyp Upland		204	204	26					26	
	Loamy Sand		195	195	71					71	
	Total		3,111	3,111	851					851	851
5037	McCrea	SD-3									
	Deep Sand		147	147	49					49	
	Sandy		148	140	46			8	2	48	
	Gyp Breaks-Hills		1,084	120	13			964	107	120	
	Gyp Uplands		4,720	1,300	185			3,420	502	687	
	Sand Hills		273	273	91			0	0	91	
	Loamy Sand		4,691	1,300	325			3,391	872	1,197	
	Shallow		222	210	52			12	3	55	
	Sandy	CP-2	842	842	280					280	
	Loamy		858	858	286					286	
	Gravelly		204	204	51					51	
	Hills & Breaks		136	136	0					0	
	Shallow		572	572	143					143	
	Total		13,897	6,102	1,521			7,795	1,486	3,007	2,489
5038	Graham, Ly.	CP-2									
	Deep Sand		7,475	7,185	1,796			290	72	1,868	
	Sandy		80	80	26					26	
	Sand Hills		393	393	98					98	
	Total		7,948	7,658	1,920			290	72	1,992	873
5039	Sand Hills	CP-2									
	Bottomlands		855			855	160			160	
	Sand Hills		735			735	116			116	
	Total		1,590			1,590	276			276	276
5040	Harral	CP-2									
	Sandy		20					20	7	7	
	Shallow		30					30	7	7	
	Sandy	SD-3	60					60	22	22	
	Bottomland		10					10	5	5	
	Gyp Breaks-Hills		900					900	120	120	
	Gyp Uplands		2,288			50	2	2,238	348	350	
	Gravelly		100			60	7	40	10	17	
	Loamy Sand		2,188			50	6	2,138	562	568	
	Active Duneland[f]		15					15	0	0	
	Shallow		90					90	26	26	
	Total		5,701			160	15	5,541	1,107	1,122	1,005
5044	Isler	CP-2									
	Deep Sand		308			308	33			33	
	Sandy		72			72	13			13	
	Sand Hills		893			893	124			124	
	Limey		88			88	13			13	
	Total		1,361			1,361	183			183	183
5047	Hilburn	HP-3									
	Deep Sand		1,075			1,075	238			238	
	Sandy		10			10	2			2	
	Sand Hills		1,165			1,165	256			256	
	Total		2,250			2,250	496			496	496
5049	Clemmons & Erdmann	CP-2									
	Deep Sand		2,213			2,213	254			254	
	Sandy		18			18	0			0	
	Sand Hills		3,175			3,175	451			451	
	Limey		22			22	0			0	
	Total		5,428			5,428	705			705	705
5051	Marley	CP-2									
	Deep Sand		7,156	122	30	7,034	1,125			1,155	
	Sand Hills		240	0	0	240	62			62	
	Bottomland		90	90	90	0	0			90	
	Loamy		20	0	0	20	0			0	
	Sand Hills		10,246	228	57	10,018	1,937			1,994	
	Total		17,752	440	177	17,312	3,124			3,301	3,152
5057	Tigner	SD-3									
	Salty Bottomland		80					80	28	28	
	Bottomland		30					30	15	15	
	Gyp Breaks-Hills		145					145	36	36	
	Gyp Upland		88					88	25	25	
	Gravelly		335					335	99	99	
	Loamy Sand		546					546	165	165	
	Total		1,224					1,224	368	368	368

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PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
(Source: Roswell District Files and Soil Surveys Chaves, Eddy, and Lea Counties)

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production						Total Potential AUMs	Total Existing AUMs[e]
				Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]			
				Acres	AUMs	Acres	AUMs	Acres	AUMs		
5058	Lynch	SD-3									
	Gyp Breaks-Hills		170					170	19	19	
	Gyp Upland		1,276					1,276	182	182	
	Loamy Sand		1,679					1,679	420	420	
	Total		3,125					3,125	621	621	327
5062	Garnsey	SD-3									
	Deep Sand		248	248	82					82	
	Sandy		370	370	123					123	
	Salty Bottomland		80					80	33	33	
	Gyp Breaks-Hills		80					80	9	9	
	Gyp Uplands		192	105	15			87	12	27	
	Gravelly		720	6	1			714	190	191	
	Loamy Sand		2,493	439	109			2,054	542	651	
	Hills & Breaks		60	60	0					0	
	Shallow Sand		30	30	10					10	
	Total		4,273	1,258	340			3,015	786	1,126	1,066
5065	Graham, A.	CP-2									
	Deep Sand		1,648			1,648	241			241	
	Sandy		840	310	103	530	117			220	
	Sand Hills		3,031			3,031	540			540	
	Active Dunes [f]		540			540	0			0	
	Hills & Breaks	HP-3	35	35	0	0	0			0	
	Shallow		30	20	5	10	0			5	
	Total		6,124	365	108	5,759	898			1,006	915
5066	Spears	CP-2									
	Deep Sand		131			131	23			23	
	Sandy		1,840	1,610	536	230	65			601	
	Sand Hills		259			259	58			58	
	Hills & Breaks		80			80	0			0	
	Shallow		120			120	26			26	
	Loamy		4			4	2			2	
	Very Shallow		86	80	20	6	2			22	
	Total		2,520	1,690	556	830	176			732	494
5068	Malstrom	CP-2									
	Deep Sand		8,359	618	155	7,741	868			1,023	
	Sand Hills		1,530	72	18	1,458	197			215	
	Limey		60	20	7	40	0			7	
	Shallow Sand		90			90	13			13	
	Deep Sand	SD-3	292	178	59	114	13			72	
	Sandy		1,894	1,426	475	468	79			554	
	Sand Hills		46	46	15		0			15	
	Limey		110	110	37		0			37	
	Shallow Sand		1,342	450	150	892	145			295	
	Total		13,723	2,920	916	10,803	1,315			2,231	1,462
5069	VHV Cattle	SD-3									
	Deep Sand		168	168	56	40	1			57	
	Sandy		718	252	84			426	142	226	
	Salty Bottomland		20					20	6	6	
	Bottomland		70	20	10			50	25	35	
	Gyp Breaks-Hills		1,452	100	11			1,352	150	161	
	Gyp Uplands		953	159	22			794	113	135	
	Gravelly		4,328	2,812	703	208	13	1,308	327	1,043	
	Loamy Sand		2,921	1,319	329	112	9	1,490	372	710	
	Hills & Breaks		480	480	0					0	
	Total		11,110	5,310	1,215	360	23	5,440	1,135	2,373	1,706
5072	Watson	SD-3									
	Deep Sand		180	163	54			17	5	59	
	Sandy		6,084	5,917	1,972			167	55	2,027	
	Bottomland		20	20	10					10	
	Gyp Breaks & Hills		153					153	17	17	
	Gyp Uplands		151	28	4			123	18	22	
	Gravelly		396	373	93			23	6	99	
	Loamy Sand		865	619	154			246	61	215	
	Hills & Breaks		770	770	0					0	
	Shallow Sand		60	60	20					20	
	Total		8,679	7,950	2,307			729	162	2,469	939
5073	Derrick, M.	CP-2									
	Deep Sand		1,530	792	198	738	173			371	
	Sandy		180	180	60					60	
	Sand Hills		816	208	52	608	173			225	
	Shallow Sand		250	240	80	10	0			80	
	Sandy	SD-3	170	170	56					56	
	Loamy Sand		10	10	2					2	
	Total		2,956	1,600	448	1,356	346			794	498

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PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
(Source: Roswell District Files and Soil Surveys Chaves, Eddy, and Lea Counties)

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production: Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]		Total Potential AUMs	Total Existing AUMs[e]
				Acres	AUMs	Acres	AUMs	Acres	AUMs		
5074	Barbe	SD-3									
	Deep Sand		96	60	20	36	11			31	
	Sandy		944	310	103	634	161			264	
	Gravelly		300	260	65	40	11			76	
	Limey		20			20	11			11	
	Shallow Sand		30	10	3	20	11			14	
	Deep Sand	CP-2	3,306	702	175	2,604	461			636	
	Sandy		670	450	150	220	69			219	
	Sand Hills		1,927	88	22	1,839	413			435	
	Total		7,293	1,880	538	5,413	1,148			1,686	1,289
5079	S & S Corp.	CP-2									
	Deep Sand		1,760	1,299	324	461	31			355	
	Sandy		240	140	46	100	11			57	
	Sand Hills		557	108	27	449	36			63	
	Total		2,557	1,547	397	1,010	78			475	191
5082	Gomez	SC-3									
	Sandy		50	50	16					16	
	Gravelly		349	279	69	70	5			74	
	Loamy Sand		20	20	5					5	
	Hills & Breaks		130	70	0	60	0			0	
	Shallow Sands		50	50	16					16	
	Shallow		190	90	22	100	7			29	
	Total		789	559	128	230	12			140	43
5083	Wilson	SD-3									
	Deep Sand		428	420	140	8				140	
	Sandy		986	940	313	46	16			329	
	Salty Bottomland		50			50	2			2	
	Bottomland		30			30	2			2	
	Gravelly		384	140	35	244	17			52	
	Loamy Sand		90	90	22					22	
	Hills & Breaks		270	210	0	60	0			0	
	Shallow Sand		1,205	1,175	392	30	1			393	
	Total		3,443	2,975	902	468	38			940	196
5084	Greenwood	SD-3									
	Deep Sand		560	560	186					186	
	Sandy		840	840	280					280	
	Salty Bottomland		90	90	30					30	
	Bottomland		60	40	20			20	10	30	
	Gyp Breaks/Hills		280	220	31			60	7	38	
	Gyp Uplands		1,355	1,190	170			165	24	194	
	Gravelly		2,124	2,124	531					531	
	Loamy Sand		2,548	2,383	595			165	41	636	
	Hills & Breaks		72	42	0	30	0			0	
	Shallow Sand		220	220	73					73	
	Total		8,149	7,709	1,916	30	0	410	82	1,998	1,097
5085	Taylor & Medlin	CP-2									
	Deep Sand		635	261	65	374	38			103	
	Sandy		2,234	1,354	451	880	88			539	
	Sand Hills		585	59	15	526	52			67	
	Shallow Sand		710	620	207	90	9			216	
	Loamy	HP-3	405	215	72	190	19			91	
	Hills & Breaks		260			260	0			0	
	Very Shallow		875	685	171	190	19			190	
	Total		5,704	3,194	981	2,510	225			1,206	627
5088	Derrick & Merritt	SD-3									
	Deep Sand		230	135	45	55	6	40	13	64	
	Sandy		230	135	45	60	9	35	12	66	
	Salty Bottomland		30	10	3	20	4			7	
	Bottomland		110	90	45	20	6			51	
	Gyp Breaks/Hills		100			100	6			6	
	Gyp Uplands		1,222	794	113	28	3	400	57	173	
	Gravelly		1,428	1,242	310	186	15			325	
	Loamy Sand		2,770	1,234	308	36	6	1,500	375	689	
	Hills & Breaks		170			170	0			0	
	Total		6,290	3,640	869	675	55	1,975	457	1,381	479
5090	Sams & Dean	CP-2									
	Deep Sand		626			626	59			59	
	Sandy		1,203	830	270	373	48			318	
	Sand Hills		868			868	73			73	
	Gravelly		150	150	37					37	
	Shallow Sand		250	40	13	210	25			38	
	Loamy	HP-3	18			18	2			2	
	Very Shallow		22			22	2			2	
	Total		3,137	1,020	320	2,117	209			529	314

TABLE A-8
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
(Source: Roswell District Files and Soil Surveys Chaves, Eddy, and Lea Counties)

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production: Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]		Total Potential AUMs	Total Existing AUMs[e]
				Acres	AUMs	Acres	AUMs	Acres	AUMs		
5091	Derrick, R.	SD-3									
	Deep Sand		104	104	35					35	
	Sandy		188	156	52	32	11			63	
	Salty Bottomland		20			20	8			8	
	Bottomland		200	200	100					100	
	Gyp Uplands		352	245	35	107	10			45	
	Gravelly		200	133	33	19	8	48	12	53	
	Loamy Sand		634	592	148	2	0	40	10	158	
	Total		1,698	1,430	403	180	37	88	22	462	79
5092	Merritt, Wm.	SD-3									
	Deep Sand		230	130	43			100	33	76	
	Sandy		180	180	60					60	
	Loamy		2,583	1,693	422			890	222	644	
	Gyp Uplands		1,746	1,276	182			470	67	249	
	Hills & Breaks		475	325	0			150	0	0	
	Total		5,214	3,604	707			1,610	322	1,029	770
6004	Warren	SD-3									
	Deep Sand		1,991	1,991	663					663	
	Sandy		180	180	60					60	
	Sand Hills		420	420	140					140	
	Active Duneland[f]		425	425	0					0	
	Total		3,016	3,016	863					863	423
6006	Caswell	SD-3									
	Deep Sand		6,573	6,573	2,190					2,190	
	Sandy		250	250	83					83	
	Loamy		80	80	20					20	
	Sand Hills		7,730	7,730	2,576					2,576	
	Hills & Breaks		40	40						0	
	Active Duneland[f]		2,976	2,976	0					0	
	Total		17,649	17,649	4,869					4,869	3,055
6008	Linam	SD-3									
	Deep Sand		4,620	20	6	4,600	250			256	
	Sandy		50			50	4			4	
	Sand Hills		5,435			5,435	737			737	
	Active Duneland[f]		946			946	0			0	
	Total		11,051	20	6	11,031	991			997	992
6009	Scharbauer	SD-3									
	Deep Sand		4,182	1,683	561	2,244	716	255	85	1,362	
	Sandy		354	329	109	25	0			109	
	Sand Hills		8,761	2,032	677	6,474	1,781	255	85	2,543	
	Gravelly		298	3	0	295	106			106	
	Loamy Sand		20	0	0	20	0			0	
	Active Duneland[f]		6,243	925	0	5,318	0			0	
	Limey		48	48	16					16	
	Deep Sand	HP-3	30			30	26			26	
	Sandy		40			40	20			20	
	Sand Hills		30			30	0			0	
	Active Duneland[f]		10			10	0			0	
	Total		20,016	5,020	1,363	14,486	2,649	510	170	4,182	3,438
6011	Smith, M.	SD-3									
	Deep Sand		7,159	750	250	6,389	760	20	7	1,017	
	Sandy		748	40	13	238	111	470	156	280	
	Gyp Uplands		27			12	0	15	2	2	
	Sand Hills		4,296			4,296	455			455	
	Loamy Sand		63			28	13	35	9	22	
	Active Duneland[f]		1,970			1,970	0			0	
	Limey		12			12	0			0	
	Total		14,275	790	263	12,945	1,339	540	174	1,776	1,414
6020	Berry	SD-3									
	Deep Sand		9,141	3,180	1,060	5,961	788			1,848	
	Sandy		2,660	2,440	813	220	42			855	
	Sand Hills		1,837	167	55	1,670	207			262	
	Gravelly		622	622	155					155	
	Active Duneland[f]		1,561	253	0	1,308	0			0	
	Total		15,821	6,662	2,083	9,159	1,037			3,120	2,152
6021	Smith, Wm.	SD-3									
	Deep Sand		6,310	3,426	1,142	2,884	235			1,377	
	Sandy		3,763	2,813	937	950	102			1,039	
	Bottomland		30	30	15					15	
	Sand Hills		583	152	50	431	29			79	
	Gravelly		2,183	2,183	545					545	
	Loamy Sand		35	35	8					8	
	Active Duneland[f]		1,315	460	0	855	0			0	
	Limey		180	180	60					60	
	Total		14,399	9,279	2,757	5,120	366			3,123	1,570

TABLE A-8
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
(Source: Roswell District Files and Soil Surveys Chaves, Eddy, and Lea Counties)

				Potential Production							
Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]		Total Potential AUMs	Total Existing AUMs[e]
				Acres	AUMs	Acres	AUMs	Acres	AUMs		
6027	Merchant	SD-3									
	Deep Sand		6,252	5,059	1,686	1,193	126			1,812	
	Sandy		3,094	1,754	584	1,340	195			779	
	Sand Hills		2,668	1,526	508	1,142	108			616	
	Gravelly		446	406	101	40	4			105	
	Loamy Sand		170	170	42					42	
	Hills & Breaks		60	60	0	0	0			0	
	Active Duneland[f]		1,866	1,190	0	676	0			0	
	Total		14,556	10,165	2,921	4,391	433			3,354	2,106
6029	Ward	SD-3									
	Deep Sand		1,864	493	164	1,371	105			269	
	Sandy		796			260	87	536	179	266	
	Sand Hills		2,019	577	192	1,442	108			267	
	Active Duneland[f]		2,324	130	0	2,194	0			0	
	Limey		174	0	0	0	0	174	58	58	
	Total		7,177	1,200	356	5,267	300	710	237	893	688
6030	Deepwell	SD-3									
	Deep Sand		720	605	201	115	15			216	
	Sandy		10	10	3					3	
	Sand Hills		1,543	300	100	1,243	174			274	
	Active Duneland[f]		1,553	320	0	1,233	0			0	
	Total		3,826	1,235	304	2,591	189			493	308
6033	Dinwiddie	SD-3									
	Deep Sand		12,535	12,535	4,178					4,178	
	Sandy		870	870	290					290	
	Sand Hills		1,000	1,000	333					333	
	Gravelly		1,390	1,390	347					347	
	Active Duneland[f]		955	955						0	
	Total		16,750	16,750	5,148					5,148	2,013
6035	Madera, R.	SD-3									
	Deep Sand		6,254	5,972	1,990	282	38			2,028	
	Sandy		341	290	96	51	44			140	
	Sand Hills		2,392	1,884	628	508	10			638	
	Gravelly		670	60	15	610	15			30	
	Active Duneland[f]		649	510	0	139	0			0	
	Total		10,306	8,716	2,729	1,590	107			2,836	1,772
6042	Dublin	SD-3									
	Deep Sand		1,096	913	304	183	34			338	
	Sandy		30			30	5			5	
	Sand Hills		2,244	1,727	575	517	84			659	
	Active Duneland[f]		3,371	1,540	0	1,831	0			0	
	Total		6,741	4,180	879	2,561	123			1,002	337
6043	Beckham	SD-3									
	Deep Sand		10,276	10,173	3,391	103	8			3,399	
	Sandy		380	330	110	50	6			116	
	Sand Hills		720	688	229	32	2			231	
	Active Duneland[f]		1,811	1,715	0	96	0			0	
	Total		13,187	12,906	3,730	281	16			3,746	1,833
6044(W)	Madera, M.	SD-3									
	Deep Sand		1,455	965	321	490	16			337	
	Sandy		695	350	116	345	17			133	
	Gravelly		166	50	12	116	5			17	
	Loamy Sand		485	320	80	165	9			89	
	Hills & Breaks		518	55	0	463	0			0	
	Active Duneland[f]		340	340	0	0	0			0	
	Total		3,659	2,080	529	1,579	47			576	222
6044(E)	Madera, M.	SD-3									
	Deep Sand		10,513	10,513	3,504					3,504	
	Sandy		852	852	284					284	
	Gyp Uplands		3	3	0					0	
	Sand Hills		256	256	85					85	
	Gravelly		70	70	17					17	
	Loamy Sand		7	7	1					1	
	Active Duneland[f]		1,578	1,576	0	2	0			0	
	Limey		30	30	10					10	
	Total		13,309	13,307	3,901	2	0			3,901	2,592
6045(E)	Madera, M. & K.	SD-3									
	Deep Sand		4,523	4,523	1,507					1,507	
	Gravelly		10	10	2					2	
	Active Duneland[f]		235	235	0					0	
	Total		4,768	4,768	1,509					1,509	335

TABLE A-8
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
(Source: Roswell District Files and Soil Surveys Chaves, Eddy, and Lea Counties)

				Potential Production							
				Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]			
Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Acres	AUMs	Acres	AUMs	Acres	AUMs	Total Potential AUMs	Total Existing AUMs[e]
6045 (SW)	Madera, M. & K.	SD-3									
	Deep Sand		7,883	7,883	2,627					2,627	
	Sandy		3,796	3,796	1,265					1,265	
	Bottomland		12	12	6					6	
	Gravelly		1,980	1,980	495					495	
	Loamy Sand		110	110	27					27	
	Hills & Breaks		190	190	0					0	
	Active Duneland[f]		830	830	0					0	
	Total		14,801	14,801	4,420					4,420	1,162
6045 (NW)	Madera, M. & K.	SD-3									
	Deep Sand		6,544	6,544	2,180					2,180	
	Sandy		2,768	2,768	922					922	
	Bottomland		392	392	196					196	
	Sand Hills		560	560	186					186	
	Active Duneland[f]		105	105	0					0	
	Total		10,369	10,369	3,484					3,484	902
6046	McDonald	SD-3									
	Deep Sand		3,158	3,158	1,052					1,052	
	Sandy		220	220	73					73	
	Sand Hills		60	60	20					20	
	Gravelly		270	270	67					67	
	Loamy Sand		70	70	17					17	
	Hills & Breaks		30	30	0					0	
	Active Duneland[f]		1,203	1,203	0					0	
	Total		5,011	5,011	1,229					1,229	339
7003	Holeman	SD-3									
	Deep Sand		1,214	1,214	405					405	
	Sandy		560	560	187					187	
	Sand Hills		1,408	1,408	469					469	
	Hills & Breaks		20	20	0					0	
	Total		3,202	3,202	1,061					1,061	355
7004	Martin	SD-3									
	Deep Sand		7,058	6,784	2,261	274	23			2,284	
	Sandy		762	652	217	110	13			230	
	Bottomland		6	6	3					3	
	Loamy		1,224	1,224	306					306	
	Sand Hills		5,315	4,904	1,635	411	30			1,665	
	Total		14,365	13,570	4,422	795	66			4,488	1,263
7005	Johnson, G.	SD-3									
	Salty Bottomland		30					30	10	10	
	Bottomland		60	60	30					30	
	Loamy		84	84	21					21	
	Gyp Breaks/Hills		790			690	37	100	14	51	
	Gyp Upland		782	56	8	626	44	100	11	63	
	Total		1,746	200	59	1,316	81	230	35	175	107
7006	Gissler	SD-3									
	Sandy		8	8	3					3	
	Loamy		787	288	72	499	157			229	
	Gyp Breaks/Hills		1,973	220	24	1,753	127			151	
	Gyp Upland		700	192	27	508	43			70	
	Gravelly		20			20	7			7	
	Total		3,488	708	126	2,780	334			460	404
7008	Williams	SD-3									
	Deep Sand		8,493	7,226	2,409	1,267	138			2,547	
	Sandy		814	680	227	134	17			244	
	Loamy		1,245	1,245	311					311	
	Sand Hills		7,671	5,820	1,940	1,851	185			2,125	
	Loamy Sand		85	60	15	25	3			18	
	Hills & Breaks		60	60	0	0				0	
	Active Duneland[f]		890			890				0	
	Rocky Land[f]		35	35	0	0				0	
	Total		19,293	15,126	4,902	4,167	343			5,245	1,356
7011	Netherlin	SD-3									
	Loamy		3,068	2,503	626			565	141	767	
	Gyp Breaks/Hills		950	50	6			900	100	106	
	Gyp Uplands		472	92	13			380	54	67	
	Gravelly		768	768	192					192	
	Hills & Breaks		155					155	0	0	
	Total		5,413	3,413	837			2,000	295	1,132	387

TABLE A-8
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
(Source: Roswell District Files and Soil Surveys Chaves, Eddy, and Lea Counties)

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production: Brush Treatment[b] Acres	Brush Treatment[b] AUMs	No Brush Treatment[c] Acres	No Brush Treatment[c] AUMs	Grassland[d] Acres	Grassland[d] AUMs	Total Potential AUMs	Total Existing AUMs[e]
7012	Snyder, L.T.D.	SD-3									
	Deep Sand		43,651	14,291	4,763	28,914	1,815	446	148	6,726	
	Sandy		21,018	10,630	3,543	7,879	495	2,509	836	4,874	
	Bottomland		4,508	3,360	1,120	897	56	251	125	1,301	
	Loamy		11,303	2,258	1,129	3,045	191	6,000	1,500	2,820	
	Gyp Breaks/Hills		1,547	40	4	634	40	873	97	141	
	Gyp Uplands		5,940	624	89	4,316	271	1,000	143	503	
	Sand Hills		23,240	4,914	1,638	18,326	1,150			2,788	
	Gravelly		3,564	2,158	539	1,210	76	196	49	664	
	Loamy Sand		772	248	62	246	15	278	69	146	
	Hills & Breaks[f]		250	55	0	195	0			0	
	Active Duneland[f]		1,025			1,025	0			0	
	Rocky Land[f]		360	360	0	0	0			0	
	Limey		486	42	14	444	28			42	
	Badland[f]		50			50	0			0	
	Waste[f]		3,873			3,873	0			0	
	Total		121,587	38,980	12,901	71,054	4,137	11,553	2,967	20,005	10,038
7013	Slash X Ranch	SD-3									
	Deep Sand		16,131	13,545	4,516	1,426	30	1,160	386	4,932	
	Sandy		15,906	12,041	4,015	2,649	54	1,216	405	4,474	
	Bottomland		582	571	287	11	0			287	
	Loamy		1,298	544	136			754	188	324	
	Gyp Breaks/Hills		450			450	9			9	
	Gyp Uplands		515	36	5			479	6	73	
	Sand Hills		8,627	8,507	2,837	120	2			2,839	
	Gravelly		5,425	3,902	976	923	19	600	150	1,145	
	Loamy Sand		140	50	13			90	22	35	
	Hills & Breaks[f]		70	70	0					0	
	Active Duneland[f]		1,020	1,020	0					0	
	Limey		6	6	2					2	
	Badland[f]		110	110	0					0	
	Total		50,280	40,402	12,787	5,579	114	4,299	1,219	14,120	3,912
7014	Stagner & Forehand	SD-3									
	Deep Sand		1,110	1,110	370					370	
	Sandy		652	652	217					217	
	Bottomland		28	28	14					14	
	Loamy		2,528	336	84			2,192	548	632	
	Gyp Uplands		1,685	224	32			1,461	209	241	
	Total		6,003	2,350	717			3,653	757	1,474	580
7015	Angel	SD-3									
	Deep Sand		4,126	3,190	1,063	640	74	296	99	1,236	
	Sandy		4,524	4,003	1,334			521	174	1,508	
	Bottomland		1,602	1,244	622			358	179	801	
	Loamy		1,182	630	158			552	138	296	
	Gyp Uplands		788	420	60			368	52	112	
	Sand Hills		210	210	70					70	
	Gravelly		293	165	41			128	32	73	
	Total		12,725	9,862	3,348	640	74	2,223	674	4,096	1,203
7016	Fanning	SD-3									
	Sandy		985	985	328					328	
	Limestone Hills		355			355	31			31	
	Loamy		3,840	1,806	452	1,404	129	630	157	738	
	Gyp Breaks/Hills		320					320	35	35	
	Gyp Uplands		2,537	612	87	1,560	142	365	52	281	
	Gravelly		360	228	57	132	13			70	
	Total		8,397	3,631	924	3,451	315	1,315	244	1,483	1,009
7018	Clayton	SD-3									
	Deep Sand		141	51	17	90	6			23	
	Sandy		2,922	2,366	789	418	25	138	46	860	
	Bottomland		164			72	4	92	46	50	
	Limestone Hills		80			80	5			5	
	Loamy		622	392	98	134	8	96	24	130	
	Gyp Uplands		510			458	28	52	7	35	
	Gravelly		188	116	29	72	3			32	
	Total		4,627	2,925	933	1,324	79	378	123	1,135	258
7020	Spears, J.	SD-3									
	Deep Sand		1,932	1,932	644					644	
	Sandy		5,386	5,318	1,773			68	23	1,796	
	Salty Bottomland		70	70	23					23	
	Bottomland		1,036	1,036	518					518	
	Loamy		4,681	1,483	371			3,198	799	1,170	
	Gyp Uplands		4,303	2,069	295			2,234	319	614	
	Sand Hills		144	144	48					48	
	Gravelly		70	70	0					0	
	Total		17,622	12,122	3,672			5,500	1,141	4,813	1,145

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PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
(Source: Roswell District Files and Soil Surveys Chaves, Eddy, and Lea Counties)

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production: Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]		Total Potential AUMs	Total Existing AUMs[e]
				Acres	AUMs	Acres	AUMs	Acres	AUMs		
7021	Campbell	SD-3									
	Deep Sand		4,789	4,548	1,516	241	22			1,538	
	Sandy		2,634	2,634	878					878	
	Bottomland		100	100	50					50	
	Loamy		1,070	1,030	257	40	10			267	
	Sand Hills		819	739	246	80	6			252	
	Gravelly		40	40	10					10	
	Active Duneland[f]		775	677	0	98	0			0	
	Rocky Land[f]		50			50	0			0	
	Limey		108	108	36					36	
	Total		10,385	9,876	2,993	509	38			3,031	1,232
7022	Key	SD-3									
	Deep Sand		17,021	14,535	4,845	2,486	203			5,048	
	Sandy		8,402	8,312	2,771	90	7			2,778	
	Salty Bottomland		50			50	4			4	
	Bottomland		616	616	308					308	
	Loamy		8,324	4,122	1,030	1,820	149	2,382	596	1,775	
	Gyp Uplands		2,501	320	46	593	49	1,588	227	322	
	Sand Hills		6,616	6,024	2,008	592	48			2,056	
	Gravelly		840	740	185	100	8			193	
	Hills & Breaks		1,020	1,020	0	0	0			0	
	Active Duneland[f]		30			30	0			0	
	Rocky Land[f]		530	530	0	0	0			0	
	Waste[f]		200	50	0	150	0			0	
	Total		46,150	36,269	11,193	5,911	468	3,970	823	12,484	4,057
7025	West	SD-3									
	Deep Sand		1,524	1,524	508					508	
	Sandy		2,434	2,389	796	45	2			798	
	Loamy		350	350	87					87	
	Gyp Uplands		528	528	75					75	
	Sand Hills		126	126	42					42	
	Gravelly		300	300	75					75	
	Total		5,262	5,217	1,583	45	2			1,585	443
7026	Pue	SD-3									
	Deep Sand		414	414	138					138	
	Sandy		333	333	111					111	
	Bottomland		112	112	56					56	
	Loamy		612	612	153					153	
	Gyp Breaks/Hills		60	60	7					7	
	Gyp Uplands		408	408	58					58	
	Sand Hills		396	396	132					132	
	Gravelly		410	410	103					103	
	Total		2,745	2,745	758					758	183
7027	Smith, K.	SD-3									
	Deep Sand		28,148	26,850	8,950	1,298	230			9,180	
	Sandy		5,406	5,396	1,799	10	2			1,801	
	Salty Bottomland		90	90	30					30	
	Bottomland		1,028	1,028	514					514	
	Loamy		1,550	1,530	383	20	4			387	
	Gyp Breaks/Hills		380	250	28	130	7			35	
	Gyp Uplands		572	572	82					82	
	Sand Hills		8,289	8,232	2,744	57	7			2,751	
	Gravelly		174	174	43					43	
	Hills & Breaks		110			110	0			0	
	Rocky Land[f]		830			830	0			0	
	Waste[f]		1,120			1,120	0			0	
	Total		47,697	44,122	14,573	3,575	250			14,823	4,009
7028	Clark	SD-3									
	Deep Sand		1,158	1,158	386					386	
	Sandy		504	504	168					168	
	Bottomland		224	224	112					112	
	Loamy		828	576	144	252	30			174	
	Gyp Breaks/Hills		230	230	26					26	
	Gyp Uplands		552	384	55	168	3			58	
	Sand Hills		882	882	294					294	
	Gravelly		3,275	3,275	818					818	
	Total		7,653	7,233	2,003	420	33			2,036	870
7031	Grandi	SD-3									
	Deep Sand		5,782	5,442	1,814	290	19	50	20	1,853	
	Sandy		7,037	6,839	2,280	198	18			2,298	
	Salty Bottomland		640	90	30			550	183	213	
	Bottomland		3,380	3,348	1,674	32	3			1,677	
	Loamy		700	616	154			84	21	175	
	Gyp Breaks/Hills		50	50	6					6	

TABLE A-8
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
(Source: Roswell District Files and Soil Surveys Chaves, Eddy, and Lea Counties)

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production						Total Potential AUMs	Total Existing AUMs[e]
				Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]			
				Acres	AUMs	Acres	AUMs	Acres	AUMs		
7031	Grandi (Continued)										
	Gyp Uplands		354	298	43			56	8	51	
	Sand Hills		1,368	1,368	456					456	
	Gravelly		4,144	3,044	761	1,100	96			857	
	Hills & Breaks		100			100				0	
	Rocky Land[f]		130			130	0			0	
	Waste[f]		344			344	0			0	
	Total		24,029	21,095	7,218	2,194	136	740	232	7,586	1,502
7033	Mobley	SD-3									
	Deep Sand		4,415	3,796	1,265	619	33			1,298	
	Sandy		1,648	1,588	530	60	3			533	
	Salty Bottomland		1,070	1,040	347	30	1			348	
	Bottomland		824	784	392	40	3			395	
	Loamy		900	700	175	200	18			193	
	Gyp Uplands		120	120	17					17	
	Sand Hills		3,095	3,023	1,008	72	3			1,011	
	Gravelly		648	648	162					162	
	Hills & Breaks		120			120	0			0	
	Total		12,840	11,699	3,896	1,141	61			3,957	1,171
7034	Greenwood	SD-3									
	Deep Sand		1,367	1,140	380	167	11	60	20	411	
	Sandy		990	930	310	60	3			313	
	Salty Bottomland		1,657	950	316	147	26	560	187	529	
	Bottomland		586	546	273	40	3			276	
	Loamy		642	596	149	46	3			152	
	Gyp Uplands		471	402	57	72	0			57	
	Sand Hills		180	180	60					60	
	Gravelly		168	110	27	58	6			33	
	Total		6,064	4,854	1,572	590	52	620	207	1,831	416
7035	J. & M. Farms	SD-3									
	Deep Sand		790	660	220	130	15			235	
	Sandy		1,407	1,407	469					469	
	Salty Bottomland		20	20	7					7	
	Bottomland		860	860	430					430	
	Loamy		550	550	137					137	
	Gyp Uplands		6	6	1					1	
	Gravelly		1,090	650	162	440	70			232	
	Rocky Land[f]		110			110	0			0	
	Total		4,833	4,153	1,426	680	85			1,511	450
7037) 7038)	Delaware	SD-3									
	Deep Sand		6,185	4,205	1,401	1,980	220			1,621	
	Sandy		6,329	6,329	2,109					2,109	
	Bottomlands		92	92	46					46	
	Loamy		644	644	161					161	
	Gravelly		5,730	2,774	693	2,956	204			897	
	Hills & Breaks		230			230	0			0	
	Total		19,210	14,044	4,410	5,166	424			4,834	1,880
7039	Lindsay	SD-3									
	Deep Sand		9,003	8,492	2,830	511	74			2,904	
	Sandy		3,444	3,444	1,148					1,148	
	Bottomland		52	52	26					26	
	Loamy		175	175	43					43	
	Sand Hills		66	66	22					22	
	Gravelly		3,819	1,854	463	1,965	286			749	
	Hills & Breaks		490			490	0			0	
	Total		17,049	14,083	4,532	2,966	360			4,892	1,970
7041	Johnson, W.	SD-3									
	Deep Sand		3,404	3,404	1,134					1,134	
	Sandy		982	982	327					327	
	Bottomland		34	34	17					17	
	Loamy		492	492	123					123	
	Gyp Uplands		1,662	1,662	237					237	
	Gravelly		500	500	125					125	
	Hills & Breaks		220	220	0					0	
	Total		7,294	7,294	1,963					1,963	496
Subtotal Proposed Systems			930,356	571,242	173,311	286,054	29,501	73.060	17,136	219,948	102,170

TABLE A-8
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE

(Source: Roswell District Files and Soil Surveys Chaves, Eddy, and Lea Counties)

				Potential Production							
				Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]			
Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Acres	AUMs	Acres	AUMs	Acres	AUMs	Total Potential AUMs	Total Existing AUMs[e]
	No Specific Grazing Systems										
5001	Sea Cattle	CP-2									
	Deep Sand		66			66	7			7	
	Sandy		825			825	147			147	
	Bottomland		330			330	62			62	
	Loamy		429			429	73			73	
	Gyp Breaks/Hills		196			196	13			13	
	Gyp Uplands		100			100	6			6	
	Gravelly		495			495	61			61	
	Loamy Sand		100			100	20			20	
	Hills & Breaks		462			462	0			0	
	Shallow		297			297	0			0	
	Total		3,300			3,300	389			389	389
5002	Gainer	CP-2									
	Deep Sand		112			112	7			7	
	Sandy		238			238	22			22	
	Total		350			350	29			29	29
5003	N. Plains Land & Inv.	CP-2									
	Sandy		120			120	15			15	
	Total		120			120	15			15	15
5004	Boone	CP-2									
	Deep Sand		1,050			1,050	114			114	
	Sandy		1,450			1,450	246			246	
	Sand Hills		530			530	70			70	
	Shallow		30			30	9			9	
	Total		3,060			3,060	439			439	439
5006	Van Eaton	CP-2									
	Loamy		96			96	11			11	
	Shallow		64			64	0			0	
	Total		160			160	11			11	11
5008	Van Eaton	CP-2									
	Deep Sand		574			574	90			90	
	Sandy		749			749	177			177	
	Sand Hills		23			23	4			4	
	Gravelly		574			547	101			101	
	Hills & Breaks		375			375	0			0	
	Shallow		47			47	4			4	
	Total		2,342			2,342	376			376	376
5009	Marley	CP-2									
	Deep Sand		1,690			1,690	120			120	
	Sandy		544			544	68			68	
	Sand Hills		360			360	34			34	
	Limey		82			82	10			10	
	Shallow		84			84	10			10	
	Sand Loamy		170			170	18			18	
	Total		2,930			2,930	260			260	260
5011	Moorhead	CP-2									
	Deep Sand		423			423	40			40	
	Sandy		738			738	97			97	
	Sand Hills		547			547	62			62	
	Shallow		174			174	10			10	
	Total		1,882			1,882	209			209	209
5013	Goods, Inc.	CP-2									
	Deep Sand		1,780			1,780	167			167	
	Sand Hills		281			281	32			32	
	Total		2,061			2,061	199			199	199
5014	McDowell (East)	CP-2									
	Deep Sand		36			36	3			3	
	Sandy		88			88	13			13	
	Shallow		36			36	2			2	
	Total		160			160	18			18	18
5015	Southard, F.	CP-2									
	Deep Sand		80			80	6			6	
	Sand Hills		80			80	7			7	
	Total		160			160	13			13	13
5016	Southard, T.	CP-2									
	Deep Sand		709			709	65			65	
	Sand Hills		661			661	73			73	
	Total		1,370			1,370	138			138	138
5017	Southard, J.	CP-2									
	Deep Sand		125			125	12			12	
	Sand Hills		195			195	25			25	
	Total		320			320	37			37	37

TABLE A-8
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
(Source: Roswell District Files and Soil Surveys Chaves, Eddy, and Lea Counties)

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production: Brush Treatment[b] Acres	Brush Treatment[b] AUMs	No Brush Treatment[c] Acres	No Brush Treatment[c] AUMs	Grassland[d] Acres	Grassland[d] AUMs	Total Potential AUMs	Total Existing AUMs[e]
5022	Smith, H.	CP-2									
	Gravelly		240			240	79			79	
	Hills & Breaks		160			160	0			0	
	Total		400			400	79			79	79
5023	White	SD-3									
	Gyp Uplands		191			191	11			11	
	Loamy Sand		191			191	55			55	
	Riparian[f]		134			134	0			0	
	Deep Sand	CP-2	310			310	55			55	
	Sandy		207			207	56			56	
	Total		1,033			1,033	177			177	177
5026	Faircloth	CP-2									
	Deep Sand		73			73	13			13	
	Sandy		578			578	154			154	
	Loamy		128			128	37			37	
	Gravelly		46			46	9			9	
	Hills & Breaks		37			37	0			0	
	Shallow		37			37	0			0	
	Gyp Uplands	SD-3	18			18	2			2	
	Total		917			917	215			215	215
5027	Nuckols	CP-2									
	Deep Sand		484			484	38			38	
	Sandy		40			40	5			5	
	Sand Hills		213			213	20			20	
	Total		737			737	63			63	63
5030	Jenkins	CP-2									
	Deep Sand		199			199	26			26	
	Sand Hills		91			91	15			15	
	Sandy	HP-3	30			30	5			5	
	Total		320			320	46			46	46
5031	Huston	HP-3									
	Deep Sand		259			259	42			42	
	Sandy		480			480	126			126	
	Sand Hills		212			212	42			42	
	Total		951			951	210			210	210
5033	Cato	CP-2									
	Deep Sand		328			328	39			39	
	Sandy		139			139	25			25	
	Sand Hills		182			182	27			27	
	Limey		11			11	0			0	
	Shallow		30			30	0			0	
	Total		690			690	91			91	91
5035	Whitelake	CP-2									
	Deep Sand		734			734	62			62	
	Sandy		220			220	29			29	
	Total		954			954	91			91	91
5039	Red Tank	CP-2									
	Deep Sand		28			28	2			2	
	Sand Hills		52			52	7			7	
	Total		80			80	9			9	9
5039	Sherman Cattle	CP-2									
	Deep Sand		166			166	17			17	
	Sand Hills		234			234	29			29	
	Total		400			400	46			46	46
5042	Glenn	CP-2									
	Deep Sand		305			305	27			27	
	Sandy		111			111	16			16	
	Loamy		18			18	2			2	
	Sand Hills		117			117	13			13	
	Limey		77			77	10			10	
	Shallow		12			12	0			0	
	Total		640			640	68			68	68
5045	Caprock Ranch	CP-2									
	Deep Sand		404			404	36			36	
	Sand Hills		1,036			1,036	110			110	
	Total		1,440			1,440	146			146	146
5050	Clemmons & Erdmann	CP-2									
	Deep Sand		274			274	30			30	
	Sand Hills		306			306	44			44	
	Deep Sand	HP-3	670			670	75			75	
	Sandy		370			370	66			66	
	Gravelly		66			66	7			7	
	Loamy Sand		44			44	7			7	
	Total		1,730			1,730	229			229	229

TABLE A-8
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
(Source: Roswell District Files and Soil Surveys Chaves, Eddy, and Lea Counties)

				Potential Production							
				Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]			
Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Acres	AUMs	Acres	AUMs	Acres	AUMs	Total Potential AUMs	Total Existing AUMs[e]
5052	Marley	CP-2									
	Deep Sand		26			26	6			6	
	Sand Hills		14			14	3			3	
	Total		40			40	9			9	9
5054	Irvin	SD-3									
	Gyp Uplands		79			79	8			8	
	Gravelly		30			30	8			8	
	Loamy Sand		281			281	117			117	
	Total		390			390	133			133	133
5056	Graham, L.	SD-3									
	Deep Sand		44			44	9			9	
	Sandy		65			65	18			18	
	Gyp Uplands		54			54	4			4	
	Gravelly		40			40	9			9	
	Loamy Sand		151			151	47			47	
	Total		354			354	87			87	87
5059	Wilson	SD-3									
	Gyp Breaks/Hills		210			210	10			10	
	Gyp Uplands		418			418	24			24	
	Loamy Sand		404			404	84			84	
	Total		1,032			1,032	118			118	118
5060	Sallee	SD-3									
	Gyp Uplands		136			136	10			10	
	Loamy Sand		90			90	25			25	
	Total		226			226	35			35	35
5061	Woods	SD-3									
	Gyp Uplands		78			78	7			7	
	Gravelly		68			68	16			16	
	Loamy Sand		194			194	60			60	
	Total		340			340	83			83	83
5064	Lee	HP-3									
	Sandy		96			96	14			14	
	Loamy		58			58	8			8	
	Gravelly		302			302	35			35	
	Loamy Sand		132			132	17			17	
	Very Shallow		72			72	9			9	
	Shallow		220			220	26			26	
	Total		880			880	109			109	109
5070	Miles	SD-3									
	Bottomland		10			10	2			2	
	Gyp Breaks/Hills		235			235	16			16	
	Gravelly		72			72	18			18	
	Loamy Sand		113			113	18			18	
	Total		430			430	54			54	54
5071	Glass	SD-3									
	Loamy		25			25	9			9	
	Gyp Breaks/Hills		55			55	2			2	
	Total		80			80	11			11	11
5081	Greer	SD-3									
	Sandy		59			59	14			14	
	Gravelly		444			444	82			82	
	Loamy Sand		30			30	5			5	
	Hills & Breaks		158			158	0			0	
	Shallow Sand		59			59	14			14	
	Shallow		237			237	0			0	
	Total		987			987	115			115	115
5089	Medlin, B.	HP-3									
	Loamy		220			220	35			35	
	Very Shallow		180			180	25			25	
	Total		400			400	60			60	60
5093	Haley	SD-3									
	Gravelly		35			35	1			1	
	Loamy Sand		56			56	2			2	
	Shallow Sand		5			5	1			1	
	Total		96			96	4			4	4
6001	McCrory	SD-3									
	Loamy Sand		40			40	10			10	
	Total		40			40	10			10	10
6002	Field	SD-3									
	Shallow		29			29	7			7	
	Total		29			29	7			7	7

TABLE A-8
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
(Source: Roswell District Files and Soil Surveys Chaves, Eddy, and Lea Counties)

				Potential Production							
Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Brush Treatment[b] Acres	Brush Treatment[b] AUMs	No Brush Treatment[c] Acres	No Brush Treatment[c] AUMs	Grassland[d] Acres	Grassland[d] AUMs	Total Potential AUMs	Total Existing AUMs[e]
6003	Taylor & Heidel	SD-3									
	Loamy Sand		11			11	3			3	
	Shallow		29			29	3			3	
	Total		40			40	6			6	6
6010	Snyder, Ltd.	SD-3									
	Sandy		120			120	13			13	
	Gravelly		381			381	36			36	
	Loamy Sand		19			19	2			2	
	Total		520			520	51			51	51
6012	Sims	SD-3									
	Deep Sand		10			10	1			1	
	Sand Hills		15			15	1			1	
	Active Duneland[f]		15			15	0			0	
	Total		40			40	2			2	2
6013	Klein	HP-3									
	Deep Sand		138			138	35			35	
	Active Duneland[f]		138			138	0			0	
	Deep Sand	SD-3	22			22	5			5	
	Active Duneland[f]		22			22	0			0	
	Total		320			320	40			40	40
6014	S & W Cattle	HP-3									
	Deep Sand		599			599	36			36	
	Sandy		20			20	2			2	
	Sand Hills		436			436	34			34	
	Gravelly		88			88	6			6	
	Loamy Sand		42			42	3			3	
	Active Duneland[f]		585			585	0			0	
	Limey		30			30	2			2	
	Total		1,800			1,800	83			83	83
6015	Kornegay	HP-3									
	Deep Sand		350			350	21			21	
	Sand Hills		638			638	48			48	
	Gravelly		40			40	3			3	
	Active Duneland[f]		572			572	0			0	
	Total		1,600			1,600	72			72	72
6016	Terry	HP-3									
	Deep Sand		150			150	19			19	
	Sandy		20			20	4			4	
	Sand Hills		313			313	51			51	
	Gravelly		10			10	2			2	
	Active Duneland[f]		314			314	0			0	
	Total		807			807	76			76	76
6017	Hill	HP-3									
	Deep Sand		180			180	12			12	
	Sand Hills		330			330	27			27	
	Active Duneland[f]		330			330	0			0	
	Total		840			840	39			39	39
6018	Turland	HP-3									
	Deep Sand		660			660	28			28	
	Sandy		20			20	1			1	
	Sand Hills		480			480	25			25	
	Deep Sand	SD-3	48			48	2			2	
	Sandy		0			0	0			0	
	Sand Hills		32			32	1			1	
	Total		1,240			1,240	57			57	57
6019	Cooper, D.	SD-3									
	Deep Sand		310			310	32			32	
	Sand Hills		385			385	35			35	
	Active Duneland[f]		265			265	0			0	
	Total		960			960	67			67	67
6024	Wallach	HP-3									
	Sandy		10			10	1			1	
	Gravelly		72			72	6			6	
	Loamy Sand		28			28	3			3	
	Waste[f]		10			10	0			0	
	Total		120			120	10			10	10
6025	Robinson	SD-3									
	Deep Sand		1,604			1,604	197			197	
	Sandy		208			208	36			36	
	Sand Hills		16			16	1			1	
	Gravelly		40			40	5			5	
	Total		1,868			1,868	239			239	239

TABLE A-8
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
(Source: Roswell District Files and Soil Surveys Chaves, Eddy, and Lea Counties)

				Potential Production							
Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Brush Treatment[b] Acres	Brush Treatment[b] AUMs	No Brush Treatment[c] Acres	No Brush Treatment[c] AUMs	Grassland[d] Acres	Grassland[d] AUMs	Total Potential AUMs	Total Existing AUMs[e]
6026	Robinson	SD-3									
	Deep Sand		410			410	63			63	
	Sand Hills		436			436	64			64	
	Active Duneland[f]		276			276	0			0	
	Total		1,122			1,122	127			127	127
6028	Brininstool, Wm.	SD-3									
	Deep Sand		730			730	41			41	
	Sandy		500			500	38			38	
	Hills & Breaks		50			50	0			0	
	Total		1,280			1,280	79			79	79
6029	Ward	SD-3									
	Gravelly		120			120	4			4	
	Total		120			120	4			4	4
6031	Goins	HP-3									
	Deep Sand		40			40	7			7	
	Sand Hills		80			80	18			18	
	Active Duneland[f]		80			80	0			0	
	Deep Sand	SD-3	170			170	32			32	
	Sand Hills		95			95	16			16	
	Active Duneland[f]		95			95	0			0	
	Total		560			560	73			73	73
6032	Winters	SD-3									
	Deep Sand		150			150	9			9	
	Sandy		170			170	16			16	
	Gravelly		70			70	5			5	
	Loamy Sand		170			170	20			20	
	Hills & Breaks		80			80	0			0	
	Total		640			640	50			50	50
6034	Wylie	SD-3									
	Deep Sand		930			930	101			101	
	Sandy		607			607	92			92	
	Sand Hills		95			95	7			7	
	Gravelly		243			243	34			34	
	Loamy Sand		70			70	12			12	
	Hills & Breaks		10			10	0			0	
	Active Duneland[f]		175			175	0			0	
	Total		2,130			2,130	246			246	246
6035	Madera, R.F., et al.	SD-3									
	Deep Sand		1,010			1,010	191			191	
	Sandy		1,551			1,551	294			294	
	Gravelly		610			610	113			113	
	Active Duneland[f]		30			30	0			0	
	Total		3,201			3,201	598			598	598
6036	Madera	SD-3									
	Deep Sand		45			45	2			2	
	Sandy		35			35	2			2	
	Total		80			80	4			4	4
6041	Dinwiddie	SD-3									
	Deep Sand		210			210	35			35	
	Sandy		110			110	23			23	
	Loamy Sand		110			110	26			26	
	Active Duneland[f]		160			160	0			0	
	Total		590			590	84			84	84
6047	Deck	SD-3									
	Deep Sand		2,083			2,083	234			234	
	Sandy		390			390	60			60	
	Sand Hills		49			49	5			5	
	Gravelly		20			20	2			2	
	Active Duneland[f]		70			70	0			0	
	Total		2,612			2,612	301			301	301
6048	Maddox	SD-3									
	Deep Sand		2,391			2,391	300			300	
	Sandy		1,965			1,965	333			333	
	Sand Hills		406			406	49			49	
	Gravelly		719			719	105			105	
	Loamy Sand		30			30	8			8	
	Active Duneland[f]		230			230	0			0	
	Limey		90			90	16			16	
	Total		5,831			5,831	811			811	811
6049	Snyder, Ltd. (Hart)	SD-3									
	Deep Sand		1,378			1,378	223			223	
	Sandy		7			7	1			1	
	Sand Hills		732			732	108			108	
	Gravelly		323			323	59			59	
	Active Duneland[f]		1,080			1,080	0			0	
	Total		3,520			3,520	391			391	391

TABLE A-8
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
(Source: Roswell District Files and Soil Surveys Chaves, Eddy, and Lea Counties)

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production						Total Potential AUMs	Total Existing AUMs[e]
				Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]			
				Acres	AUMs	Acres	AUMs	Acres	AUMs		
6050	Hilburn	SD-3									
	Loamy Sand		19			19	7			7	
	Shallow		21			21	3			3	
	Total		40			40	10			10	10
7001	Haven	SD-3									
	Deep Sand		88			88	3			3	
	Sandy		62			62	3			3	
	Salty Bottomland		100			100	4			4	
	Bottomland		0			0	0			0	
	Loamy		603			603	34			34	
	Gyp Uplands		522			522	6			6	
	Total		1,375			1,375	50			50	50
7002	Karr	SD-3									
	Deep Sand		30			30	2			2	
	Salty Bottomland		40			40	3			3	
	Loamy		246			246	23			23	
	Gyp Uplands		352			352	7			7	
	Total		668			668	35			35	35
7009	Evans	SD-3									
	Bottomland		199			199	12			12	
	Loamy		53			53	3			3	
	Gravelly		597			597	22			22	
	Hills & Breaks		52			52	0			0	
	Total		901			901	37			37	37
7010	Solt	SD-3									
	Deep Sand		174			174	10			10	
	Sandy		1,176			1,176	98			98	
	Bottomland		287			287	30			30	
	Gravelly		263			263	21			21	
	Total		1,900			1,900	159			159	159
7017	Greenwood, H.	SD-3									
	Sandy		375			375	12			12	
	Bottomland		250			250	10			10	
	Loamy		405			405	14			14	
	Total		1,030			1,030	36			36	36
7023	Beker Ind.	SD-3									
	Sandy		563			563	44			44	
	Salty Bottomland		158			158	10			10	
	Loamy		406			406	26			26	
	Total		1,127			1,127	80			80	80
7024	Simpson	SD-3									
	Deep Sand		273			273	16			16	
	Sandy		1,172			1,172	96			96	
	Bottomland		44			44	4			4	
	Sand Hills		36			36	1			1	
	Gravelly		270			270	21			21	
	Total		1,795			1,795	138			138	138
7029	Bond	SD-3									
	Sandy		712			712	76			76	
	Bottomland		40			40	6			6	
	Loamy		150			150	20			20	
	Gyp Uplands		413			413	16			16	
	Gravelly		380			380	40			40	
	Total		1,695			1,695	158			158	158
7030	Tracy	SC-3									
	Sandy		20			20	0			0	
	Gravelly		599			599	33			33	
	Total		619			619	33			33	33
Subtotal No Systems			76,822			76,822	8,684			8,684	8,684
GRAND TOTAL			1,590,134	961,364	295,588	541,933	56,156	86,837	19,966	371,710	175,167

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[a] Range sites are listed by SCS major land resource areas (MLRA): SD3 = Southern Desert, CP 2 = Pecos-Canadian Plains and Valleys, HP3 = Southern High Plains.

[b] Brush removal and proper management; forage production would approximate SCS projection for that range site in excellent condition by year 2000.

[c] Forage production by year 2000 should approximate existing production levels. However, without brush control, production would be declining after year 2000.

[d] Grasslands with proper management should recover to SCS projection for that range site in excellent condition by year 2000.

[e] Data is from 1977 Range Survey.

[f] Designates land types.

APPENDIX
II

APP II

Appendix 2

RANGE CONDITION METHODOLOGY

Range condition is described in the ES in terms of suitability for livestock grazing. Each allotment was evaluated by BLM personnel to determine the composition and density of desirable and less desirable livestock forage plants. Results for each allotment are available from BLM's Roswell District files. Conditions are defined as follows:

Good condition: Composition is 40 percent or more of both desirable and intermediate species with at least 20 percent made up of desirable species with a soil surface factor (SSF, described in Soils Section of Chapter 2) of less than 40.

Fair condition: Composition includes 15-39 percent of desirable and intermediate species with desirable species making up 5 or more percent and with a SSF of less than 60. Areas with 60 percent of intermediate species but less than 5 percent of the vegetation being made up of desirable species would also be in fair condition when the SSF is less than 60.

Poor condition: Compositon or SSF values do not meet above criteria.

These criteria are from BLM Instruction Memorandum No. 75-52, Change 1 of March 10, 1975.

Range condition under each alternative is predicted by the amount of brush control proposed when compared to the amount of control under the proposed action. For example, the mechanical brush control alternative would only restore 263,106 acres to good condition, roughly one-third the acreage treated under the proposed action. Therefore, only one-third of the allotments currently in fair condition are expected to improve to good condition. The same rationale was used to predict the number of allotments which are in good condition as presented in Appendix Table 8-2.

METHODOLOGY FOR DETERMINING WIND ERODIBILITY GROUPS (WEG)

Soils were placed in wind erodibility groups according to the texture of the surface inch of soil, unless very wet or stony, according to the following Soil Conservation Service (SCS) technical guide (1976).

Guide for Estimating the Wind Erodibility Group from Soil Textures

Texture of surface inch	WEG
Very fine sand, fine sand, and medium sand	1
Loamy sand, loamy fine sand	2
Very fine sandy loam, fine sandy loam, sandy loam	3

Clay, silty clay, noncalcareous clay loam, and silty clay loam with more than 35 percent clay content	4
Calcareous loam and silt loam, calcareous clay loam and silty clay loam with less than 35 percent clay content	4L
Noncalcareous loam and silt loam with less than 20 percent clay content, sandy clay loam, sandy clay	5
Noncalcareous loam and silt loam with more than 20 percent clay content, noncalcareous clay loam with less than 35 percent clay content	6
Silt: noncalcareous silty clay loam with less than 35 percent clay content	7
Very wet or stony, not subject to wind erosion	8

Adjectives to be used in describing the soil blowing hazard based on wind erodibility group are:

WEG-1	Very High Soil Blowing Hazard
WEG-2	Very High Soil Blowing Hazard
WEG-3	High Soil Blowing Hazard
WEG-4	High Soil Blowing Hazard
WEG-4L	High Soil Blowing Hazard
WEG-5	Moderate Soil Blowing Hazard
WEG-6	Moderate Soil Blowing Hazard
WEG-7	Moderate Soil Blowing Hazard
WEG-8	Slight Soil Blowing Hazard

PSIAC METHODOLOGY

The Pacific Southwest Inter-Agency Committee's (PSIAC) (1968) method for determining relative soil loss was used to compute the water erosion portion of the soils section.

The Sediment Yield Classification is:

Classification	Rating	Sediment Yield AF/Sq. mi./yr.
1 Severe	More than 100	More than 3.0
2 Critical	75-100	1.0-3.0
3 Moderate	50- 75	0.5-1.0
4 Slight	25- 50	0.2-0.5
5 Stable	0- 25	Less than 0.2

Nine factors were evaluated for present and future soil loss and points were assigned to each factor by using the PSIAC nomographs. The points were totaled for each soil and they were then placed in erosion classes. The following are the assumptions which were made to determine these ratings.

Note: AF/sq.mi./yr. = acre feet per square mile per year.

Factors	Rating
A. - Surface Geology -	0 - 10

Soil texture from a depth of 0-4 inches was used to determine this rating. Sandy soils received the lowest rating and soils with a high clay content received a high rating.

B. - Soils -	0 - 10

This factor was rated the same as surface geology except the depth is from 4 inches to the effective rooting depth.

C. - Climate -	0 - 10

Climate was rated according to the value on the nomograph for a 2-year isopluvial storm in the NOAA Atlas 2.

D. - Run-off -	0 - 10

Run-off was rated the same as climate for the existing environment.

E. - Topography -	0 - 20

This factor was rated according to the percentage of slope. A soil with a 30 percent slope was given the maximum number of points.

F. - Cover -	-10-+10

The amount of cover includes the percentage of cover from vegetation and coarse fragments on the soil surface. A soil which has 100 percent cover would receive a rating of -10.

G. - Land Use - -10-+10

Land use was determined by the percentage of utilization from the Vegetation section. A soil with 70 percent utilization would receive a rating of 1.

H. - Upland Erosion - 0 - 25

Soil Surface Factors (SSFs) were used for rating the amount of upland erosion. The SSF for the modal soil was used.

I. - Channel Erosion and Sediment Transport - 0 - 25

The rating for this factor was determined by field observation for the amount of gullying.

All the PSIAC factor points were totaled and were assigned a sediment relative-yield value.

PSIAC CONVERSION FACTORS

PSIAC Factor	Sediment Yield (ac.ft./sq. mi./yr)	PSIAC Factor	Sediment Yield (ac.ft./sq. mi./yr.)	PSIAC Factor	Sediment Yield (ac.ft./sq. mi./yr.)	PSIAC Factor	Sediment Yield (ac.ft./sq. mi./yr.)
1	.0	26	.190	51	.52	76	1.25
2	.0	27	.20	52	.53	77	1.30
3	.0	28	.20	53	.55	78	1.35
4	.0	29	.21	54	.56	79	1.40
5	.0	30	.22	55	.58	80	1.45
6	.1	31	.24	56	.60	81	1.50
7	.1	32	.25	57	.63	82	1.55
8	.11	33	.26	58	.65	83	1.60
9	.11	34	.27	59	.68	84	1.65
10	.12	35	.28	60	.70	85	1.78
11	.12	36	.29	61	.73	86	1.80
12	.13	37	.30	62	.75	87	1.90
13	.130	38	.31	63	.79	88	2.0
14	.14	39	.33	64	.82	89	2.05
15	.138	40	.34	65	.85	90	2.1
16	.140	41	.35	66	.87	91	2.15
17	.143	42	.36	67	.91	92	2.20
18	.145	43	.37	68	.95	93	2.30
19	.148	44	.38	69	.98	94	2.40
20	.150	45	.40	70	1.00	95	2.50
21	.160	46	.42	71	1.08	96	2.00
22	.170	47	.44	72	1.15	97	2.70
23	.18	48	.45	73	1.18	98	2.80
24	.19	49	.48	74	1.20	99	2.90
25	.19	50	.50	75	1.23	100	3.00

All these sediment yields were estimated using the PSIAC method for analysis purposes only and were not developed as a result of actual measurements of sediment yield. They indicate relative ranges of values and are considered valid in identifying trends, etc.

TABLE B-1
MAJOR VEGETATION ASPECTS AND RANGE SITES OF OCCURRENCE[a]
(Source: BLM Files)

Range Site of Usual Occurrence	Major Vegetative Aspects[b]
	SHRUBLANDS
	Mesquite/
Sandy, Loamy, Gyp Uplands, Gravelly	Black grama, Threeawn
Bottomland, Loamy, Gyp Upland, Draws	Tobosa
Bottomland, Loamy, Draws, Riparian[c]	Alkali sacaton
Sandy, Loamy, Gyp Uplands, Gravelly, Draws	Bush muhly
	Mesquite/Shinnery Oak
Deep Sand, Sandy, Sand Hills, Active Duneland,[c] Shallow Sand Loamy Sand	Threeawn, Dropseeds
	Mesquite/Sand Sage
Deep Sand, Sandy, Sand Hills	Dropseeds, Threeawn
	Shinnery Oak/
Deep Sand, Sandy, Sand Hills, Shallow Sand, Loamy Sand, Active Duneland[c]	Dropseed, Threeawn
Sandy, Loamy Sand, Sandy Plains[c]	Black grama
Deep Sand, Sandy, Sand Hills, Active Duneland	Dropseed
Deep Sand, Sandy, Sand Hills, Loamy Sand, Sandy Plains	Bluestem, Dropseed
	Shinnery Oak/Sand Sage
Deep Sand, Sandy, Sand Hills, Loamy Sand, Sandy Plains, Active Duneland[c]	Threeawn, Dropseed, Bluestem
	Creosote/
Limestone Hills, Gravelly, Hills and Breaks	Black grama, Bush muhly
Limestone Hills, Gyp Hills and Breaks, Gyp Uplands, Gravelly, Hills and Breaks, Rocky Land[c]	Bush muhly
Limestone Hills, Gyp Hills and Breaks, Gyp Uplands, Gravelly, Hills and Breaks, Rocky Land[c]	Fluffgrass, Burrograss
Limestone Hills, Gyp Hills and Breaks, Gyp Uplands, Hills and Breaks, Rocky Land[c]	Burrograss, Ring Muhly
	Mesquite
Loamy, Gyp Uplands, Gravelly, Hills and Breaks	Black grama, Bush Muhly
	Catclaw acacia/Creosote
Gravelly, Hills and Breaks, Very Shallow, Rocky Land[c]	Black grama, Fluffgrass
	Javelinabush/Ratany
Limestone Hills, Gravelly, Hills and Breaks	Threeawn, Dropseed
	Fourwing saltbush/Mesquite
	Catclaw acacia, Creosote,
Sandy, Bottomland, Sand Hills, Shallow Sand, Shallow, Loamy Sand	Threeawn, Bush muhly
	GRASSLANDS
Gyp Hills and Breaks, Gyp Uplands	Tobosa/Burrograss
Bottomland, Draws	Buffalograss
Salty Bottomland, Bottomland, Salt Flats, Riparian[c]	Alkali Sacaton/Mesquite/Saltcedar
Sandy, Gravelly, Shallow Sand, Loamy Sand, Sandy Plains	Black grama/Hairy grama
Deep Sand, Sandy, Loamy, Sand Hills, Loamy Sand, Sandy Plains	Threeawn/Dropseed
Gyp Hills and Gyp Breaks, Gyp Uplands	Burrograss/Ring muhly
Most nonalkaline sites	Snakeweed/Threeawn
	RIPARIAN
	Mesquite/Saltcedar
	Alkali sacaton
Salty Bottomland, Bottomland, Riparian[c]	Tobosa
	UNIQUE SUBTYPES
	Littleleaf sumac/Mesquite
Loamy, Hills and Breaks, Draws	Threeawn, Dropseed
Deep Sand, Sandy, Bottomland, Sand Hills, Gravelly	Soapberry
Deep Sand, Sandy, Bottomland, Draws, Active Duneland[c]	Desert Walnut
	One-seed juniper/Littleleaf sumac
Deep Sand, Sandy	Dropseed

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[a] Aspect vegetation is that which is apparent across the landscape to the casual observer. Aspect vegetation types are not considered to be true vegetation types.

[b] Major plants are identified as: Dominant/Subdominant/Associated Species.

[c] Land type.

TABLE B-2
SOIL SERIES AND INTERPRETATIONS
(Source: SCS Soil Surveys: Eddy, Lea, and Chaves Counties, 1971-74-78, respectively)

Soil Series (& Land Types)	Productivity (lbs./ac. Dry Wt.) Normal Years	Surface Texture	Slope %	WEG	Sediment Yield Ac. Ft./ Sq. Mi./Yr.*	Erosion Class**	Range Site
Alama	900	loam	0-3	6	.56	Moderate	Bottomland SD-3
Amarillo	2,100	loamy fine sand	0-2	2	.38	Slight	Sandy HP-3
Anthony	450	sandy loam	0-1	3	.26	Slight	Sandy SD-3
Arch	900	fine sandy loam	0-3	3	.38	Slight	Limy HP-3
Arno	1,500	clay	0-1	4	.45	Slight	Salty Bottomland SD-3
Arvana	2,000	fine sandy loam	0-3	3	.38	Slight	Loamy Sand HP-3
Atoka	750	loam	0-3	4L	.42	Slight	Loamy SD-3
Badland***		sandy loam	15-30	3	1.23	Critical	Badland***
Blamorhea	1,750	clay loam	0-2	6	.38	Slight	Salty Bottomland SD-3
Bascom	1,050	fine sandy loam	2-7	3	.87	Moderate	Gravelly SD-3
Berino	750	fine sandy loam	0-3	3	.53	Moderate	Sandy SD-3
Bigetty	900	sandy loam	0-3	3	.33	Slight	Loamy SD-3
Bippus	2,400	loam	0-3	6	.37	Slight	Bottomland SD-3
Blakeney	1,000	fine sandy loam	0-5	3	.37	Slight	Shallow Sandy SD-3
Brownfield	2,200	fine sand	0-5	1	.34	Slight	Loamy Sand HP-3
Cacique	650	loamy sand	0-3	2	.48	Slight	Sandy SD-3
Canez	950	fine sandy loam	0-2	3	.40	Slight	Loamy Sand CP-2
Cottonwood	650	loam	0-3	6	.33	Slight	Salty Bottomland SD-3
Dona Ana	350	sandy loam	0-2	3	.38	Slight	Sandy SD-3
Drake	1,400	loamy fine sand	1-5	5	.33	Slight	Sandy CP-2
Duneland***		fine sand	2-25	1	.60	Moderate	Active Duneland***
Faskin	1,500	fine sand	0-2	2	.37	Slight	Sandy Plains CP-2
Glendale	700	fine sandy loam	0-2	4	.33	Slight	Bottomland SD-3
Gomez	2,100	loamy fine sand	0-3	2	.29	Slight	Deep Sand HP-3
Gypsum Land	350	loam	5-25	4L	1.00	Critical	Gyp Hills SD-3
Harkey	1,000	fine sandy loam	0-3	4L	.34	Slight	Sandy SD-3
Holloman	800	loam	0-30	4L	.65	Moderate	Gyp Upland SD-3
Ima	900	loamy fine sand	0-7	4L	.40	Slight	Deep Sand SD-3
Jal	700	sandy loam	0-5	3	.50	Moderate	Limy CP-2
Jalmar	1,500	fine sand	0-2	1	.30	Slight	Deep Sand CP-2
Karro	700	loam	0-3	4L	.75	Moderate	Sandy SD-3
Kermit	1,300	fine sand	0-3	1	.45	Slight	Sand Hills SD-3
Kimbrough	500	gravelly fine sandy loam	0-5	4	.31	Slight	Very Shallow HP-3
LaLande	850	fine sandy loam	0-2	5	.37	Slight	Draw SD-3
LaLande	850	fine sandy loam	0-2	5	.37	Slight	Loamy CP-7
Largo	750	loam	0-5	4L	.52	Moderate	Bottomland SD-3
Lea	1,000	fine sandy loam	0-3	3	.37	Slight	Loamy HP-3
Likes	2,000	loamy fine sand	1-5	2	.35	Slight	Deep Sand SD-3
Maljamar	1,200	fine sand	0-3	1	.45	Slight	Deep Sand SD-3
Malstrom	1,300	loamy fine sand	0-4	2	.37	Slight	Sandy Plains CP-2
Mansker	1,750	loam	0-3	6	.50	Moderate	Sandy CP-2
Midessa	2,100	loam	0-3	3	.50	Moderate	Sandy SD-3
Mobeetie	2,250	fine sandy loam	1-10	3	.40	Slight	Sandy SD-3
Pajarito	650	loamy fine sand	0-3	2	.30	Slight	Deep Sand SD-3
Palomas	1,300	fine sand	0-5	1	.44	Slight	Deep Sand CP-2
Patricia	2,200	fine sand	0-3	1	.37	Slight	Deep Sand CP-2
Pecos	1,300	clay loam	0-1	6	.37	Slight	Bottomland SD-3
Philder	900	gravelly fine sandy loam	0-9	3	.52	Moderate	Gravelly SD-3
Pima	1,000	silt loam	0-1	4L	.35	Slight	Bottomland SD-3
Pintura	450	loamy fine sand	3-15	2	.45	Slight	Deep Sand SD-3
Portales	1,000	loam	0-3	4L	.35	Slight	Loamy CP-2
Potter	7,000	gravelly fine sandy loam	5-15	4	.45	Slight	Gravelly SD-3
Pyote	1,500	fine sand	0-3	1	.36	Slight	Deep Sand SD-3
Quay Like	750	fine sandy loam	0-3	3	.40	Slight	Loamy CP-2
Ratliff	1,750	fine sandy loam	0-2	3	.33	Slight	Sandy SD-3
Reakor	750	loam	0-3	4L	.38	Slight	Loamy SD-3
Redona	950	fine sandy loam	0-2	3	.38	Slight	Loamy Sand CP-2
Reeves	850	loam	0-2	4L	.42	Slight	Loamy CP-2
Rock Outcrop***	-	-		8	0	Stable	-
Roswell	1,500	fine sand	2-8	1	.36	Slight	Deep Sand CP-2, SD-3
Roswell	1,500	fine sand	8-25	1	.48	Slight	Sand Hills CP-2
Russler	800	silty clay loam	0-3	4L	.45	Slight	Loamy SD-3
Sharvana	1,500	fine sandy loam	0-3	3	.34	Slight	Shallow Sand CP-2
Simona	550	fine sandy loam	0-5	3	.35	Slight	Shallow Sand SD-3
Slaughter	1,500	fine sandy loam	0-1	3	.36	Slight	Loamy HP-3
Sotim	600	fine sandy loam	0-5	3	.60	Moderate	Loamy SD-3
Springer	2,500	loamy fine sand	0-3	2	.34	Slight	Deep Sand HP-3
Stegall	1,600	loam	0-1	5	.38	Slight	Loamy HP-3
Stony and Rough Broken Land	350	gravelly loam	20-80	8	.95	Moderate	Hills and Breaks
Tencee	250	gravelly loam	1-30	4L	.70	Moderate	Gravelly SD-3
Tivoli	1,400	fine sand	2-13	1	.44	Slight	Sand Hills HP-3
Tonuco	875	loamy fine sand	0-3	1	.30	Slight	Sandy SD-3
Torreorthents	400	fine sandy loam	2-30	8	.70	Moderate	Breaks CP-2
Upton	350	gravelly loam	0-5	4L	.44	Slight	Shallow SD-3

CP = Pecos-Canadian Plains and Valleys Land Resource Area; HP = High Plains Land Resource Area; SD = Southern Desert Land Resource area; WEG = Wind Erodibility Group; * = Sediment yield figures given are relative values and not exact values measured at that particular point each time; ** = Erosion Class is determined from methodology PSIAC Method (pg. A-28). Land types are designated by three asterisks.

TABLE B-3
RANGE SITE AND SOILS LEGEND
(Source: SCS Soil Surveys: Eddy, Lea, and Chaves Counties, 1971-74-78, respectively)

Soil Series or Land Types	Range Site or Land Type
Duneland ***	Active Duneland***
Badland ***	Badland***
Alama, Bippus, Glendale Largo, Pecos, Pima	Bottomland
Gomez, Ima, Jalmar, Likes, Maljamar, Pajarito, Palomas, Patricia, Pintura, Pyote, Roswell, Springer	Deep Sand
LaLande	Draws
Bascom, Philder, Potter, Tencee, Upton	Gravelly
Gypsum Land	Gyp Hills and Breaks
Holloman	Gyp Upland
Stony and Rough Broken Land, Torreorthents	Hills and Breaks
Arch, Jal	Limy
Atoka, Bigetty, LaLande, Lea, Portales, Quay Like, Reakor, Reeves, Russler, Slaughter, Sotim Stegall	Loamy
Amarillo, Arvana, Brownfield, Canez, Redona	Loamy Sand
Stony Land	Rockland
Playas	Salt Flats
Arno, Balmorhea, Cottonwood	Salty Bottomland
Kermit, Roswell, Tivoli	Sand Hills
Amarillo, Anthony, Arch, Arvana, Berino, Cacique, Dona Ana, Drake, Harkey, Karro, Mansker, Midessa, Mobeetie, Ratliff, Sharvana, Tonuco	Sandy
Canez, Ratliff, Redona	Sandy Loam
Faskin, Malstrom, Pyote	Sandy Plains
Blakeney, Sharvana, Simona	Shallow Sand
Kimbrough	Very Shallow
	Waste***

***Land types are designated by three asterisks.

TABLE B-4
ESTIMATED EROSION RATES FOR RANGE SITES
(Source: SCS Soil Surveys: Eddy, Lea, and Chaves Counties, 1971-74-78, respectively)

RANGE SITE OR LAND TYPE	PRESENT AVERAGE SEDIMENT YIELD AF/SQ. MI./YR.	PRESENT EROSION CLASS	AVERAGE SEDIMENT YIELD AFTER THE PROPOSED ACTION AF/SQ. MI./YR.	EROSION CLASS AFTER THE PROPOSED ACTION	PERCENT DECREASE
Active Duneland ***	.60	Moderate	.60	Moderate	26
Badland***	1.23	Critical	1.23	Critical	0
Bottomland	.41	Slight	.32	Slight	22
Deep Sand	.36	Slight	.28	Slight	22
Draws	.37	Slight	.29	Slight	22
Gravelly	.60	Moderate	.45	Slight	25
Gyp Hills and Breaks	1.00	Critical	1.00	Critical	0
Gyp Upland	.65	Moderate	.53	Moderate	18
Hills and Breaks	.83	Moderate	.83	Moderate	0
Limy	.44	Slight	.33	Slight	25
Loamy	.40	Slight	.31	Slight	22
Loamy Sand	.37	Slight	.29	Slight	21
Rockland	1.00	Critical	1.00	Critical	0
Salt Flats	-	-	-	-	
Salty Bottomland	.37	Slight	.33	Slight	11
Sand Hills	.46	Slight	.32	Slight	30
Sandy	.42	Slight	.31	Slight	26
Sandy Plains	.37	Slight	.28	Slight	24
Shallow	.44	Slight	.37	Slight	16
Shallow Sand	.35	Slight	.28	Slight	20
Very Shallow	.31	Slight	.26	Slight	16
Waste***	1.25	Critical	1.25	Critical	0

Sediment yield figures given are relative values and not exact values measured at a particular point each time. Land types are designated by three asterisks.

TABLE B-5

SOIL SERIES SEDIMENT YIELDS AND EROSION CLASSES WITH AND WITHOUT SPECIFIC GRAZING MANAGEMENT

(Source: SCS Soil Surveys: Eddy, Lea, and Chaves Counties, 1971-74-78, respectively)

Soil Series or Land Type	Present Sediment Yield (AF/sq. mi./yr.) and Erosion Class*		With Specific Grazing - Sediment Yields and Erosion Class*		Percent Decrease
Alama	.56	Moderate	.40	Slight	29
Amarillo	.38	Slight	.29	Slight	24
Anthony	.26	Slight	.21	Slight	19
Arch	.38	Slight	.31	Slight	18
Arno	.45	Slight	.38	Slight	16
Arvana	.38	Slight	.31	Slight	18
Atoka	.42	Slight	.33	Slight	21
Badland (Type)	1.23	Critical	1.23	Critical	
Balmorhea	.38	Slight	.33	Slight	13
Bascom	.87	Moderate	.63	Moderate	28
Berino	.53	Moderate	.40	Slight	25
Bigetty	.33	Slight	.28	Slight	15
Bippus	.37	Slight	.31	Slight	16
Blakeney	.36	Slight	.28	Slight	22
Brownfield	.34	Slight	.25	Slight	26
Cacique	.48	Slight	.34	Slight	29
Canez	.40	Slight	.31	Slight	23
Cottonwood	.33	Slight	.28	Slight	15
Dona Ana	.38	Slight	.30	Slight	21
Drake	.33	Slight	.25	Slight	24
Duneland**	.60	Moderate	.60	Moderate	0
Faskin	.37	Slight	.28	Slight	24
Glendale	.33	Slight	.27	Slight	18
Gomez	.29	Slight	.24	Slight	17
Gypsum Land **	1.00	Critical	1.00	Critical	0
Harkey	.34	Slight	.28	Slight	18
Holloman	.65	Moderate	.53	Moderate	18
Ima	.40	Slight	.30	Slight	25
Jal	.50	Moderate	.35	Slight	30
Jalmar	.30	Slight	.21	Slight	30
Karro	.75	Moderate	.55	Moderate	27
Kermit	.45	Slight	.33	Slight	27
Kimbrough	.31	Slight	.26	Slight	16
LaLande	.37	Slight	.29	Slight	22
Largo	.52	Moderate	.36	Slight	12
Lea	.37	Slight	.29	Slight	22
Likes	.35	Slight	.26	Slight	26
Maljamar	.45	Slight	.34	Slight	24
Malstrom	.37	Slight	.28	Slight	24
Mansker	.50	Moderate	.36	Slight	28
Midessa	.50	Moderate	.36	Slight	28
Mobeetie	.40	Slight	.30	Slight	25
Pajarito	.30	Slight	.21	Slight	30
Palomas	.44	Slight	.33	Slight	25
Patricia	.37	Slight	.29	Slight	22
Pecos	.37	Slight	.33	Slight	11
Philder	.52	Moderate	.37	Slight	29
Pima	.35	Slight	.30	Slight	14
Pintura	.45	Slight	.35	Slight	22
Portales	.35	Slight	.28	Slight	20
Potter	.45	Slight	.34	Slight	24
Pyote	.36	Slight	.27	Slight	25
Quay Like	.40	Slight	.31	Slight	23
Ratliff	.33	Slight	.24	Slihgt	27
Reakor	.38	Slight	.31	Slight	24
Redona	.33	Slight	.30	Slight	9
Reeves	.42	Slight	.33	Slight	21
Rock Outcrop**	0	-	0	-	0
Roswell (2-8% slopes)	.36	Slight	.26	Slight	28
Roswell (8-25% slopes)	.48	Slight	.34	Slight	29
Russler	.45	Slight	.35	Slight	22
Sharvana	.34	Slight	.28	Slight	18
Simona	.35	Slight	.27	Slight	23
Slaughter	.36	Slight	.30	Slight	17
Sotim	.60	Moderate	.40	Slight	33
Springer	.34	Slight	.28	Slight	18
Stegall	.38	Slight	.33	Slight	13
Stony and Rough Broken Land	.95	Moderate	.95	Moderate	0
Stony Land**	0	-	0	-	0
Tencee	.70	Moderate	.53	Moderate	24
Tivoli	.44	Slight	.31	Slight	30
Tonuco	.30	Slight	.21	Slight	30
Torreorthents	.70	Moderate	.70	Moderate	3
Upton	.44	Slight	.37	Slight	7

*Sediment yield figures given are relative values and not exact values measured at that particular point each time.

**Land types are designated by two asterisks.

TABLE B-6
FEDERAL ENDANGERED, FEDERAL STATUS UNDETERMINED, STATE ENDANGERED GROUPS I AND II, AND STATE RESTRICTED WILDLIFE
EAST ROSWELL ES AREA
(Source: BLM District Files)

SPECIES				HABITAT CONDITION***			
COMMON NAME	SCIENTIFIC NAME	STATUS*	TOTAL HABITAT***	POOR	FAIR	GOOD	EXCELLENT
			FISH				
Blue Sucker	Cycleptus elongatus	SE I	(P) 42 m	22			
			(T) 122 m	122			
Mexican Tetra	Astyanaz Mexicanus	SE II	(P) 42 m	22			
			(T) 122 m	122			
Gray Redhorse	Moxostoma congestum	SE I	(P) 42 m	22			
			(T) 122 m	122			
Big Scale Perch	Percina macrolepida	SE II	(P) 42 m	22			
			(T) 122 m	122			
Silverband Shiner	Notropis shumardi	SE I	(P) 42 m	22			
			(T) 122 m	122			
Greenthroat Darter	Etheostoma lepidum	SE II	(P) 42 m	22			
			(T) 122 m	122			
			AMPHIBIANS				
Eastern Barking Frog	Hylactophyrne augusti latrans	SE II	(P) unknown				
			(T) unknown				
Blanchard's Cricket Frog	Acris crepitans blanchardi	SE II	(P) 42 m	42			
			(T) 152 m	152			
			REPTILES				
Texas Slider Turtle	Crysemys concinna texana	SE II	(P) 42 m	40	2		
			(T) 152 m	150	2		
Sandune Sagebrush Lizard	Sceloporus graciosus arenicolous	SE II	(P) 179 a		115	64	
			(T) 222 a		121	102	
Mottled Rock Rattlesnake	Crotalus lepidus lepidus	SE II	(P) 20 a		20		
			(T) 160 a		160		
Trans-Pecos Rat Snake	Elaphe subocularis	SE II	(P) 320 a		320		
			(T) 1,360 a		1,360		
Pecos-Western Ribbonsnake	Thamnophis proximus diabolicus	SE II	(P) 68 sa	68			
			(T) 391 sa	391			
Blotched Plain-bellied Water Snake	Natrix erythrogaster transversa	SE II	(P) 68 sa	68			
			(T) 391 sa	391			
			BIRDS				
Southern Bald Eagle	Haliaeetus leucocephalus leucocephalus	FE & SE I	(P) 15,994 a	15,571	4,253		
			(T) 56,261 a	38,904	17,357		
Peregrine Falcon	Falco peregrinus	SE & SE I	(P) 15,994 a	15,994			
			(T) 56,261 a	56,261			
Little Blue Heron	Florida caerulea	SE I	(P) 33 a	33			
			(T) 95 a	95			
Baird's Sparrow	Ammodramus bairdii	SE II	(P) 15,995 a	15,995			
			(T) 56,261 a	56,261			
Mississippi Kite	Ictinia mississipiensis	SE II	(P) 4,386 a	4,307		77	
			(T) 23,657 a	23,235	4	418	
Red-headed Woodpecker	Melanerpes erythrocephalus	SE II	(P) 4,386	4,307		77	
			(T) 23,657 a	23,235	4	418	

*FE = Federal Endangered: Danger of extinction possible throughout all or significant parts of its range.
SE I = State Endangered Group I: Survival or recruitment in the state in jeopardy.
SE II = State Endangered Group II: Survival or recruitment in the state in may be in jeopardy in the foreseeable future.
**a = 100s of acres.
m = miles of stream.
sa = surface acres of ponds, playas, tanks in 100s of acres.
(P) = public land.
(T) = ES Area.
***Poor = New Mexico Department of Game and Fish and/or BLM have determined that habitat conditions are rapidly deteriorating.
Fair = New Mexico Department of Game and Fish and/or BLM have determined that habitat conditions are marginal and are supporting low populations.
Good = New Mexico Department of Game and Fish and/or BLM have determined that habitat conditions are stable with no present threats to populations.
Excellent = New Mexico Department of Game and Fish and/or BLM have determined that habitat conditions are stable and/or trampling with populations increasing.

TABLE B-6
FEDERAL ENDANGERED, FEDERAL STATUS UNDETERMINED, STATE ENDANGERED GROUPS I AND II, AND STATE RESTRICTED WILDLIFE
EAST ROSWELL ES AREA
(Source: BLM District Files)

SPECIES COMMON NAME	SCIENTIFIC NAME	STATUS*	TOTAL HABITAT***	HABITAT CONDITION*** POOR	FAIR	GOOD	EXCELLENT
			BIRDS (Continued)				
Bell's Vireo	*Vireo bellii*	SE II	(P) 31 a	28		3	
			(T) 47 a	44		3	
McCown's Longspur	*Rynchophanes mccowni*	SE II	(P) 8,088 a	8,088			
			(T) 34,524 a	34,524			
Least Tern	*Sterna albifrons*	SE II	(P) 32 sa	32			
			(P) 20 m	20			
			(T) 95 sa	95			
			(T) 130 m	130			
			MAMMALS				
Black-footed Ferret	*Mustela nigripes*	FE SE I			Unknown		

*FE = Federal Endangered: Danger of extinction possible throughout all or significant parts of its range.
SE I = State Endangered Group I: Survival or recruitment in the state in jeopardy.
SE II = State Endangered Group II: Survival or recruitment in the state in may be in jeopardy in the foreseeable future.
**a = 100s of acres.
m = miles of stream.
sa = surface acres of ponds, playas, tanks in 100s of acres.
(P) = public land.
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***Poor = New Mexico Department of Game and Fish and/or BLM have determined that habitat conditions are rapidly deteriorating.
Fair = New Mexico Department of Game and Fish and/or BLM have determined that habitat conditions are marginal and are supporting low populations.
Good = New Mexico Department of Game and Fish and/or BLM have determined that habitat conditions are stable with no present threats to populations.
Excellent = New Mexico Department of Game and Fish and/or BLM have determined that habitat conditions are stable and/or trampling with populations increasing.

TABLE B-7
GAME ANIMALS, FURBEARERS, AND PREDATORS EAST ROSWELL ES AREA
(Source: Step 3 URA BLM Files)

Species				Habitat Condition***			
Common Name	Scientific Name	Status*	Total Habitat**	Poor	Fair	Good	Excellent
Canada Goose	Branta canadensis	G	(P) 9 SA	2	7		
			(T) 48 SA	48	7		
Snow Goose	Chen hyperborea	G	(P) 9 SA	2	7		
			(T) 48 SA	48	7		
Mallard	Anas platyrhycos	G	(P) 9 SA	2	7		
			(T) 48 SA	48	7		
Pintail	Anas acuta	G	(P) 9 SA	2	7		
			(T) 48 SA	48	7		
Gadwall	Anas strepera	G	(P) 9 SA	2	7		
			(T) 48 SA	48	7		
Common Widgeon	Mareca americana	G	(P) 9 SA	2	7		
			(T) 48 SA	48	7		
Blue-Winged Teal	Anas discors	G	(P) 9 SA	2	7		
			(T) 48 SA	48	7		
Green-Winged Teal	Anas carolinensis	G	(P) 9 SA	2	7		
			(T) 48 SA	48	7		
Cinnamon Teal	Anas cyanoptera	G	(P) 9 SA	2	7		
			(T) 48 SA	48	7		
Redhead	Athya americana	G	(P) 9 SA	2	7		
			(T) 48 SA	48	7		
Canvasback	Athya valisineria	G	(P) 9 SA	2	7		
			(T) 48 SA	48	7		
Ring-Necked Duck	Athya Collaris	G	(P) 9 SA	2	7		
			(T) 48 SA	48	7		
Lesser Scaup	Athya affinis	G	(P) 9 SA	2	7		
			(T) 48 SA	48	7		
Common Goldeneye	Bucephala clangula	G	(P) 9 SA	2	7		
			(T) 48 SA	48	7		
Ruddy Duck	Oxyura jamaicensis	G	(P) 9 SA	2	7		
			(T) 48 SA	48	7		
Common Merganser	Mergus merganser	G	(P) 9 SA	2	7		
			(T) 48 SA	48	7		
Hooded Merganser	Lophodytes cucullatus	G	(P) 9 SA	2	7		
			(T) 48 SA	48	7		
Shoveler	Spatula clypeata	G	(P) 9 SA	2	7		
			(T) 48 SA	48	7		
Lesser Sandhill Crane	Grus canadensis	G	(P) 9 SA	2	7		
			(T) 48 SA	48	7		
Lesser Prairie Chicken	Tympanuchus pallidicinctus	G	(P) 5,214	4,941	120	153	
			(T) ?				
Scaled Quail	Callipela squamata	G	(P) 15,994 A			15,994	
			(T) 56,261 A			56,261	
Bobwhite Quail	Colinus virginianus	G	?				
Mourning Dove	Zenaidura macroura	G	(P) 15,994 A			15,994	
			(T) 56,261 A			56,261	
Ring-Necked & White-Winged Pheasant	Phasianus colchicus	G	?				
Pronghorn Antelope	Antilocapra americana	G	(P) 10,530 A	5,630	3,876	1,024	
			(T) 38,429 A	24,724	13,705		
Mule Deer	Odocoileus hemionus	G	(P) 8,180 A	1,600	1,420	5,160	
			(T) 21,853 A	10,042	11,151	760	
Whitetail Deer	Odocoileus virginianus	U	(P) 279 A	260	19		
			(T) 339 A	243	96		
Raccoon	Procyon lotor	F	(P) 4,420 A	4,312	108		
			(T) 33,060 A	32,510	512	38	
Ringtail Cat	Bassariscus astutus	F	(P) 564 A	46	25	493	
			(T) 768 A	?	?	?	
Longtail Weasel	Mustela frenata	F	(P) 4,810 A	4,810			
			(T) 28,044 A	28,044			
Gray Fox	Urocyon cinereoargenteus	F	(P) 7,724 A	7,356	221	147	
			(T) 33,631 A	32,704	519	408	
Red Fox	Vulpes fulva	F	?				
Badger	Taxidea taxus	F	(P) 15,994 A	11,718	4,276		
			(T) 56,261 A	28,084	28,177		
Coyote	Canis latrans	P	(P) 15,940 A			15,940	
			(T) 56,261 A			56,261	
Bobcat	Lynx rufus	P	(P) 15,940 A		5,910	10,030	
			(T) 21,853 A	10,042	11,151	760	
Beaver	Castor canadensis	F	(P) 42 M	42			
			(T) 122 M	122			
Muskrat	Ondatra zibethica	F	(P) 42 M	42			
			(T) 122 M	122			

P - Predator
G - Game
F - Furbearer
U - Unique

** = A - 100s of acres
SA - Surface acres of ponds, playas, tanks in 100s of acres
(P) - Public land
(T) - ES Area

*** = Poor - New Mexico Dept. of Game and Fish and/or BLM have determined that habitat conditions are rapidly deteriorating.
Fair - New Mexico Dept. of Game and Fish and/or BLM have determined that habitat conditions are marginal and are supporting low populations.
Good - New Mexico Dept. of Game and Fish and/or BLM have determined that habitat conditions are stable with no present threats to populations
Excellent - New Mexico Dept. of Game and Fish and/or BLM have determined that habitat conditions are stable and/or improving with populations increasing.

TABLE B-8
THE AUDUBON SOCIETY'S 1978 BLUE-LISTED BIRDS
EAST ROSWELL ES AREA
(Source: Step 3 URA BLM Files)

Species		Total Habitat*	Habitat Condition**			
Common Name	Scientific Name		Poor	Fair	Good	Excellent
Black-Crowned Night Heron	*Nycticorax nycticorax*	(P) 42 M	42			
		(T) 152 M	152			
Canvasback	*Aythya valisineria*	(P) 53 SA	53			
		(T) 140 SA	140			
Sharp-Shinned Hawk	*Accipiter striatus*	(P) 8,875 A	8,875			
		(T) 14,548 A	14,548			
Cooper's Hawk	*Accipiter cooperii*	(P) 8,875 A	8,875			
		(T) 14,548 A	14,548			
Swainson's Hawk	*Buteo swainsoni*	(P) 15,994 A		15,994		
		(T) 56,261 A		56,261		
Ferruginous Hawk	*Buteo regalis*	(P) 15,994 A	11,399	4,595		
		(T) 56,261 A	24,724	32,537		
Harris' Hawk	*Parabuteo unicinctus*	(P) 8,875 A		8,875		
		(T) 14,548 A		14,548		
Marsh Hawk	*Circus cyaneus*	(P) 15,994 A		15,994		
		(T) 56,261 A		56,261		
Osprey	*Pandion haliaetus*	(P) 42 M	42			
		(T) 152 M	152			
Prairie Falcon	*Falco mexicanus*	(P) 15,994 A	11,399	4,595		
		(T) 56,261 A	24,724	37,537		
Merlin	*Falco sparverius*	(P) 68 A	68			
		(T) 391 A	391			
American Kestrel	*Falco columbarius*	(P) 15,994		15,994		
		(T) 56,261		56,261		
Upland Sandpiper	*Bartramia longicauda*	(P) 15,994 A	11,399	4,595		
		(T) 56,261 A	24,724	32,537		
Least Tern	*Sterna albifrons*	(P) 7 A		7		
		(T) 20 A		20		
Black Tern	*Chlidonias niger*	(P) 42 M	42			
		(T) 152 M	152			
Yellow-Billed Cuckoo	*Coccyzus americanus*	(P) 68 A	68			
		(T) 391 A	391			
Barn Owl	*Tyto alba*	(P) 15,994 A	15,994			
		(T) 56,261 A	56,261			
Burrowing Owl	*Speotyto cunicularia*	(P) 15,994 A		15,994		
		(T) 56,261 A		56,261		
Short-Eared Owl	*Asio flammeus*	(P) 550 A		550		
		(T) 781 A		781		
Yellow-Breasted Chat	*Icteria virens*	(P) 68	68			
		(T) 391	391			
Dickcissel	*Spiza americana*	(P) 15,994	15,994			
		(T) 56,261	56,261			
Vesper Sparrow	*Pooecetes gramineus*	(P) 15,994	15,994			
		(T) 56,261	56,261			

* = A = 100s of acres
M = Miles of stream
(P) = Public land
(T) = ES Area
** = Poor = New Mexico Dept. of Game and Fish and/or BLM have determined that habitat conditions are rapidly deteriorating.
Fair = New Mexico Dept. of Game and Fish and/or BLM have determined that habitat conditions are marginal and are supporting low populations.
Good = New Mexico Dept. of Game and Fish and/or BLM have determined that habitat conditions are stable with no present threats to populations.
Excellent = New Mexico Dept. of Game and Fish and/or BLM have determined that habitat conditions are stable and/or improving with populations increasing.

Source: Arbib. R. A. 1977. Blue List for 1978. American Birds 31:1087-1096

Blue List: Species currently undergoing population declines.

TABLE B-9
EXISTING USE ON ALLOTMENTS WITH AND WITHOUT AMPs
(Source: Roswell District Files)

				AVERAGE 3-YEAR USE					
(A) ALLOT. NO.	ALLOTMENT NAME	NUMBER OF LICENSEES	(B) GRAZING PREFERENCE AUMs	(C) ACTIVE LICENSE 3-YEAR AVERAGE*	(D) VOLUNTARY NONUSE	(E) SUSPENDED NONUSE	PERCENT PUBLIC LAND	(F) CLASS OF LIVESTOCK	SEASON OF USE
	EXISTING USE ON ALLOTMENTS WITH AMPs								
5043	Sand Ranch	1	1,650	1,510	140		55	C	Yearlong
5046	Caprock Ranch	1	1,578	1,578			62	C	Yearlong
5053	Culp, C.	1	2,847	1,996	851		65	CH	Yearlong
5063	Culp, J.	1	449	375	74		52	C	Yearlong
5075	Bogle	1	37,940	27,113	10,827		52	CH	Yearlong
5077	Williams, P.	1	2,978	2,628	350		73	C	Yearlong
5078	Slash ML Ranch	1	966	1,155			70	C	Yearlong
6007	Caviness	1	2,622	2,660			94	C	Yearlong
6022	Bingham	1	1,080	1,080			90	C	Yearlong
6028	Brininstool, W.	1	2,383	1,842	1	540	99	C	Yearlong
6037	Diamond & Half, Inc.	1	4,344	4,344			37	CH	Yearlong
6038	James	1	3,774	2,956	818		85	C	Yearlong
6039	Robbins	1	2,580	1,910	154	516	86	CH	Yearlong
6040	Brininstool, C.	1	1,476	1,027	77	372	92	C	Yearlong
7007	Haines	1	630	502	101		70	C	Yearlong
7019	Rains	1	940	467	473		87	C	Yearlong
7032	Sanders	1	13,236	8,827		4,536	84	C	Yearlong
7036	Madera & McDonald	2	3,348	1,731	1,617		93	C	Yearlong
7040	Jackson	1	11,327	5,617	5,710		93	C	Yearlong
7042	Twin Wells	1	8,251	5,334	2,688		70	C	Yearlong
	TOTAL (J)	21	104,399	74,652	23,881	5,964			
	EXISTING USE ON ALLOTMENTS WITHOUT AMPs								
5005	Denton	1	1,200	1,200			100	C	Yearlong
5007	Cooper, M.	1	480	480			40	C	Yearlong
5010	Moorhead	1	516	516			100	C	Yearlong
5012	Moorhead	1	720	720			100	C	Yearlong
5014	McDowell (west)	1	384	384			100	C	Yearlong
5018	Bilberry	1	584	584			100	C	Yearlong
5019	Cooper, M.	1	536	537			47	CH	Yearlong
5020	Sturgeon	1	1,011	1,011			69	C	Yearlong
5021	Wagner	1	853	853			49	C	Yearlong
5024	Durham	1	663	663			69	C	Yearlong
5025	Marley	1	944	813			47	C	Yearlong
5028	Bilbrey	1	1,498	1,839			52	C	Yearlong
5029	McCombs	1	663	663			46	C	Yearlong
5032	Davis	1	1,656	1,656			60	C	Yearlong
5034	Seeligson	1	2,869	2,869			48	C	Yearlong
5036	Cooper, C.	1	503	482	21		32	CH	Yearlong
5037	McCrea	1	2,907	2,315	592		57	CH	Yearlong
5038	Graham, Ly.	1	1,608	2,698			100	C	Yearlong
5039	Sand Hills	1	336	336			100	C	Yearlong
5040	Harral	1	1,255	1,255			22	CH	Yearlong
5044	Isler	1	297	186	111		38	C	Yearlong
5047	Hilburn	1	314	314			71	C	Yearlong
5049	Clemmons & Erdmann	2	840	840			43	C	Yearlong
5051	Marley	1	2,882	2,713	39		76	C	Yearlong
5057	Tigner	1	228	228			49	C	Yearlong
5058	Lynch	1	528	555			50	C	Yearlong
5062	Garnsey	1	720	710	10		43	C	Yearlong
5065	Graham, A.	1	972	898	74		44	C	Yearlong
5066	Spears	1	406	406			53	C	Yearlong
5068	Malstrom	1	2,145	2,145			55	CH	Yearlong
5069	VHV Cattle	1	1,785	2,601			35	C	Yearlong
5072	Watson	1	1,654	879	775		52	C	Yearlong
5073	Derrick, M.	1	521	521			71	CH	Yearlong
5074	Barbe	1	1,050	1,050			70	C	Yearlong
5079	S & S Corp.	1	377	340	37		19	C	Yearlong
5082	Gomez	1	143	56		88	31	C	Yearlong
5083	Wilson	1	596	597			54	CH	Yearlong
5084	Greenwood	1	1,683	1,412	271		85	C	Yearlong

A - Allotments are numbered by county. Each county is usually numbered north to south (5000 Chaves County) (6000 Lea County) (7000 Eddy County)
B - Grazing privilege established from 1940 - 1941 range survey
C - Active licensed use is derived from the average use of 1975, 1976, and 1977
D - Voluntary nonuse of grazing privileges initiated by ranchers
E - Forage production less than the total preference on eight allotments has required reduced grazing. Preference reductions would continue until BLM verifies availability of forage. The 1978 regulations eliminated this category and preference now must conform with forage production.
F - Class of livestock: C = Cattle, H = Horse
J - Totals from all allotments on last page of Table 2
* - Licensed use is higher than preference in some instances because of temporary nonrenewable AUMs

TABLE B-9
EXISTING USE ON ALLOTMENTS WITH AND WITHOUT AMPs

				AVERAGE 3-YEAR USE					
(A) ALLOT. NO.	ALLOTMENT NAME	NUMBER OF LICENSEES	PREFERENCE AUMs	(C) ACTIVE LICENSE 3-YEAR AVERAGE*	(D) VOLUNTARY NONUSE	(E) SUSPENDED NONUSE	PERCENT PUBLIC LAND	(F) CLASS OF LIVESTOCK	SEASON OF USE
5085	Taylor & Medlin	1	1,068	1,068	480		20	C	Yearlong
5088	Derrick & Merritt	2	1,458	502	956		86	C	Yearlong
5090	Sams & Dean	2	540	540			60	C	Yearlong
5091	Derrick, R.	1	338	333	5		35	C	Yearlong
5092	Merritt, Wm.	1	1,106	588	518		89	C	Yearlong
6004	Warren	1	444	444			100	C	Yearlong
6006	Caswell	1	2,400	1,786	614		35	C	Yearlong
6008	Linam	1	1,785	1,300	485		97	C	Yearlong
6009	Scharbauer	1	3,512	2,902	626		28	CH	Yearlong
6011	Smith, M.	1	2,832	2,155	677		59	C	Yearlong
6020	Berry	1	3,553	3,334	219		56	CH	Yearlong
6021	Smith, Wm.	1	3,617	3,215	402		83	CH	Yearlong
6027	Merchant	1	2,968	2,968			100	C	Yearlong
6029	Ward	1	1,151	1,151			100	C	Yearlong
6030	Deepwell	1	612	612			100	C	Yearlong
6033	Dinwiddie	1	3,420	2,919	529		75	CH	Yearlong
6035	Madera, R.	1	1,791	1,613	178		27	C	Yearlong
6042	Dublin	1	804	804			100	C	Yearlong
6043	Beckham	1	2,343	2,141	202		61	CH	Yearlong
6044	Madera, M.	1	660	1,916	1,048		76	C	Yearlong
6044	Madera, M.	1	2,304	G	G		G	C	Yearlong
6045	Madera, M. & K.	1	905	1,777	2,157		83	CH	Yearlong
6045	Madera, M. & K.	1	3,029	H			H	C	Yearlong
6045	Madera, M. & K.	1	2,640	2,237	403		80	C	Yearlong
6046	McDonald	1	857	706	151		84	C	Yearlong
7003	Holeman	1	567	567			63	C	Yearlong
7004	Martin	1	1,806	1,262	544		86	C	Yearlong
7005	Johnson, G.	1	278	221	57		70	C	Yearlong
7006	Gissler	1	672	672			80	C	Yearlong
7008	Williams	1	2,819	2,740	79		77	C	Yearlong
7011	Netherlin	1	923	923			53	C	Yearlong
7012	Snyder L.T.D.	1	21,319 I	21,141			81	CH	Yearlong
7013	Slash X Ranch	1	10,200	7,365	2,786		85	CH	Yearlong
7014	Stagner & Forehand	2	970	342	628		77	C	Yearlong
7015	Angel	1	1,507	1,507			81	CH	Yearlong
7016	Fanning	1	1,215	1,134	81		81	C	Yearlong
7018	Clayton	1	420	377	43		35	C	Yearlong
7020	Spears, J.	1	2,362	1,933	429		96	CH	Yearlong
7021	Campbell	1	2,274	1,959		316	76	CH	Yearlong
7022	Key	1	6,324	6,332			85	CH	Yearlong
7025	West	1	420	421			76	CH	Yearlong
7026	Pue	1	564	418	146		94	C	Yearlong
7027	Smith, K.	1	7,769	6,568	1,201		78	CH	Yearlong
7028	Clark	1	1,173	1,174			85	CH	Yearlong
7031	Grandi	1	2,789	2,766	23		83	CH	Yearlong
7033	Mobley	1	1,953	1,309		644	79	C	Yearlong
7034	Greenwood	1	1,066	1,067			74	CH	Yearlong
7035	J. & M. Farms	1	443	205	443		82	C	Yearlong
7037	Dealware	1	3,984	2,040	2,141		61	CH	Yearlong
7038	Delaware	1	192	192			89	C	Yearlong
7039	Lindsay	1	2,957	2,957			88	C	Yearlong
7041	Johnson, W.	1	819	819			91	C	Yearlong
5001	Sea Cattle	1	660	660			100	C	Yearlong
5002	Gainer	1	72	72			100	C	Yearlong
5003	N. Plains Land & Inv.	1	40	40			100	C	Yearlong
5004	Boone	1	768	768			100	C	Yearlong
5006	Van Eaton	1	48	48			100	C	Yearlong
5008	Van Eaton	1	490	410	80		24	CH	Yearlong
5009	Marley	1	624	552			100	C	Yearlong
5011	Moorhead	1	516	516			100	C	Yearlong
5013	Goods, Inc.	1	384	384			100	C	Yearlong
5014	McDowell (East)	1	72	72			100	C	Yearlong
5015	Southard, F.	1	36	36			100	C	Yearlong
5016	Southard, T.	1	144	144			100	C	Yearlong
5017	Southard, J.	1	60	60			100	C	Yearlong
5022	Smith, H.	1	36	36			100	C	Yearlong
5023	White	1	212	212		37	22	CH	Yearlong
5026	Faircloth	1	216	216			100	C	Yearlong
5027	Nuckols	1	144	144			100	C	Yearlong
5030	Jenkins	1	84	84			100	C	Yearlong
5031	Huston	1	243	243			100	C	Yearlong
5033	Cato	1	144	144			100	C	Yearlong
5035	White Lake	1	192	192			100	C	Yearlong
5039	Red Tank	1	16	16			100	C	Yearlong
5039	Sherman Cattle	1	80	80			100	C	Yearlong
5042	Glenn	1	108	108			100	C	Yearlong
5045	Caprock Ranch	1	316	316			100	C	Yearlong
5050	Clemmons & Erdmann	2	468	468			100	C	Yearlong
5052	Marley	1	12	12			100	C	Yearlong
5054	Irvin	1	84	84			100	C	Yearlong
5056	Graham, Li.	1	60	60			100	C	Yearlong

TABLE B-9
EXISTING USE ON ALLOTMENTS WITH AND WITHOUT AMPs

(A) ALLOT. NO.	ALLOTMENT NAME	NUMBER OF LICENSEES	PREFERENCE AUMs	AVERAGE 3-YEAR USE (C) ACTIVE LICENSE 3-YEAR AVERAGE*	AVERAGE 3-YEAR USE (D) VOLUNTARY NONUSE	AVERAGE 3-YEAR USE (E) SUSPENDED NONUSE	PERCENT PUBLIC LAND	(F) CLASS OF LIVESTOCK	SEASON OF USE
5059	Wilson	1	228	228			22	CH	Yearlong
5060	Sallee	1	24	24			100	C	Yearlong
5061	Woods	1	48	43			25	C	Yearlong
5064	Lee	1	176	176			100	C	Yearlong
5070	Miles	1	60	60			31	C	Yearlong
5071	Glass	1	12	12			100	C	Yearlong
5081	Greer	1	178	138			24	C	Yearlong
5089	Medlin, B.	1	180	180			100	C	Yearlong
5093	Haley	1	20	12			100	C	Yearlong
6001	McCrory	1	12	12			100	C	Yearlong
6002	Field	1	5	5			100	C	Yearlong
6003	Taylor & Heidel	2	11	11			100	C	Yearlong
6010	Snyder Ltd.	1	96	96			100	C	Yearlong
6012	Sims	1	12	12			100	C	Yearlong
6013	Klein	1	78	78			100	C	Yearlong
6014	S & W Cattle	1	406	406			100	C	Yearlong
6015	Kornegay	1	300	300			100	C	Yearlong
6016	Terry	1	197	197			100	C	Yearlong
6017	Hill	1	236	236			100	C	Yearlong
6018	Turland	1	116	116			100	C	Yearlong
6019	Cooper, D.	1	269	269			100	C	Yearlong
6024	Wallach	1	23	23			100	C	Yearlong
6025	Robinson	1	526	526			100	C	Yearlong
6026	Robinson	1	180	180			100	C	Yearlong
6028	Brininstool, Wm.	1	252	252			100	C	Yearlong
6029	Ward	1	20	20			100	C	Yearlong
6031	Goins	1	158	153			100	C	Yearlong
6032	Winters	1	216	216			100	C	Yearlong
6034	Wylie	1	408	408			100	C	Yearlong
6035	Madera	1	612	612			100	C	Yearlong
6036	Madera	1	24	24			100	C	Yearlong
6041	Dinwiddie	1	48	48			100	C	Yearlong
6047	Deck	1	490	490			100	C	Yearlong
6048	Maddox	1	1,524	1,524			100	C	Yearlong
6049	Snyder, Ltd. (Hart)	1		713			27	C	Yearlong
6050	Hilburn	1	12	12			100	C	Yearlong
7001	Haven	1	264	176	88		51	C	Yearlong
7002	Karr	1	120	120			100	C	Yearlong
7009	Evans	1	96	96			100	C	Yearlong
7010	Solt	1	347	347			85	C	Yearlong
7017	Greenwood, H.	1	180	180			100	C	Yearlong
7023	Beker, Ind.	1	156	104	52		46	CH	Yearlong
7024	Simpson	1	175	175			56		Yearlong
7029	Bond	1	210	210			35	C	Yearlong
7030	Tracy	1	84	84			100	C	Yearlong
	Totals without AMPs	170	177,367	159,233	20,401	1,085			
	Totals with AMPs	21	104,399	74,652	23,881	5,964			
	Grand Total	191	281,766	233,855	44,282	7,049			

A - Allotments are numbered by county. Each county is usually numbered north to south (5000 Chaves County) (6000 Lea County) (7000 Eddy County)
B - Grazing privilege established from 1940 - 1941 range survey
C - Active licensed use is derived from the average use of 1975, 1976, and 1977
D - Voluntary nonuse of grazing privileges initiated by ranchers
E - Forage production less than the total preference on eight allotments has required reduced grazing. Preference reductions would continue until BLM verifies availability of forage. The 1978 regulations eliminated this category and preference now must conform with forage production.
F - Class of livestock: C = Cattle, H = Horse
J - Totals from all allotments on last page of Table 2
* - Licensed use is higher than preference in some instances because of temporary nonrenewable AUMs

APPENDIX
III

APP III

TABLE C-1
SUSCEPTIBILITY[a] OF COMMON WOODY PLANTS IN THE EAST ROSWELL ES AREA TO PROPOSED HERBICIDES
(Source: Bovey, 1977)

HERBICIDE	Dicamba			Picloram				Picloram and Dicamba[c]				
Selective[b]	Yes			Yes				Yes				
Nonselective	No			No				No				
Soil Effective	Yes			Yes				Yes				
APPLICATION METHODS[d] / SPECIES	BS	FS	ST	BS	FS	I/CS	ST	FS	May Resprout	Spray at Full Foliage	Spray in: Spring	Fall
Baccharis	I	I-R		S	S							
Broom snakeweed					S			S			X	
Catclaw acacia		I-R	R		S		S	S	X	X	X	X
Cottonwood		S				S						
Creosote		S-I	S		S-I		S	S				
Desert ceonothus							S					
Fourwing saltbush								I-R				
Javelina bush	R				R			R				
Juniper	S	I		S	S-I		S					
Littleleaf sumac		S			S		S					
Lotebush conadalia	S-I	I-R	I-R	S	I-R		S	I-R				
Mesquite	S-I	S	S	R	S		R	S	X			
Netleaf hackberry			S-I			S	S					
Prickly pear			I-R	S	S		S					
Saltcedar		S		S			S					
Sand sage					S			I-R			X	
Shinnery oak		I	R		S-I		S-R	I		X		
Tarbush		I	S				S-I					
Walnut		S			S							
Willow					S				X	X	X	
Wolfberry		R			R							

[a] S = Susceptible (one application kills more than 70 percent of stand)
S-I = Susceptible to Intermediate (two applications needed to kill at least 70 percent of stand)
I = Intermediate (top kill results from one or two treatments. Retreatment necessary for plant kill)
I-R = Intermediate to Resistant (tops and sprouts killed by chemical, but roots continually resprout)
R = Resistant (Virtually unaffected by herbicide)

[b] Selective denotes effective action towards a group of species, i.e., woody plants versus herbaceous plants.

[c] Data for picloram and dicamba were provided in personal communication with Girard, New Mexico State University, and Jacoby, Texas A & M University

[d] BS = Basal Spray; FS = Foliar Spray; I/CS = Injection/Cut Surface Treatment; ST = Soil Treatment.

TABLE C-2
PERCENT OF LITTER, VEGETATION AND BARE GROUND ON TWO SITES FOLLOWING MESQUITE CONTROL AND ON ONE SITE WHERE LIVESTOCK HAVE BEEN EXCLUDED
(Source: BLM Phase 1 Watershed Inventory 1971)

Ground Cover Component[a]	Brininstool Allot. #6040		Robbins Allot. #6039		Gnome Exclosure	
	Treat.[b]	No Treat.	Treat.[b]	No Treat.	Grazing[c]	No Grazing[d]
Vegetation	26	16	28	13	17	23
Litter	43	11	34	12	14	45
Bare Ground	31	73	38	74	69	32

[a] Data were gathered using standard BLM 100 pace transects in April 1971 on treated and adjacent untreated areas. Because of the small sample size, data are considered only to describe general vegetation trends.

[b] Treatment with 2,4,5-T in 1965 killed approximately 40 percent of a heavy mesquite stand.

[c] Grazing practices have not been well documented on this site. General management has been yearlong grazing at 40 to 60 percent utilization.

[d] Livestock had been excluded from the "no grazing" transect's site about 15 years before sampling date.

TABLE C-3

PROJECTED AUMS ON PUBLIC LANDS WITH THE PROPOSED ACTION

(Source: Roswell District Files)

(A)		(B)	(C)	(D)		(E)	(F)	(G)
Allot. No.	Name	Grazing Preference AUMS	Active License Use AUMS*	AUMS Change From License Increase	Reduction	Livestock AUMS Available (1978)	Livestock AUMS Available (2000)	Change From (1978) to (2000)
Existing Specific Grazing Systems								
5043	Sand Ranch	1,650	1,510		-530	980	1,104	+124
5046	Caprock Ranch	1,578	1,578		-823	755	755	0
5053	Culp, C.	2,847	1,996	+428		2,424	2,591	+167
5063	Culp, J.	449	375		-54	321	529	+208
5075	Bogle	37,940	27,113		-5,909	21,204	46,113	+24,909
5077	Williams, P.	2,978	2,628		-677	1,951	2,413	+462
5078	Slash ML Ranch	966	1,155		-599	556	752	+196
6007	Caviness	2,622	2,660		-1,000	1,660	4,466	+2,806
6022	Bingham	1,080	1,080		-742	338	714	+376
6028	Brininstool, W.	2,383	1,842		-804	1,038	4,009	+2,971
6037	Diamond & Half, Inc.	4,344	4,344		-1003	3,341	7,263	+3,922
6038	James	3,774	2,956	+2,100		5,056	8,287	+3,231
6039	Robbins	2,580	1,910		-837	1,073	1,915	+842
6040	Brininstool, C.	1,476	1,027		-281	746	1,644	+898
7007	Haines	630	502		-63	439	1,022	+583
7019	Rains	940	467		-150	317	1,453	+1,136
7032	Sanders	13,236	8,827		-283	8,544	20,787	+12,243
7036	Madera & McDonald	3,348	1,731		-14	1,717	5,862	+4,145
7040	Jackson	11,327	5,617		-207	5,410	17,837	+12,427
7042	Twinwells	8,251	5,334		-1,085	4,249	12,356	+8,107
Subtotal 1		104,399	74,652	+2,528	-15,061	62,119	141,872	+79,753
Proposed Specific Grazing Systems								
5005	Denton	1,200	1,200		-527	673	915	+242
5007	Cooper, M.	480	480	+37		517	770	+253
5010	Moorhead	516	516		-250	266	266	0
5012	Moorhead	720	720		-206	514	536	+22
5014	McDowell (west)	384	384		-245	139	139	0
5018	Bilberry	584	584		-271	313	313	0
5019	Cooper, M.	536	537	+5		542	880	+338
5020	Sturgeon	1,011	1,011		-442	569	1,011	+442
5021	Wagner	853	853		-187	666	1,059	+393
5024	Durham	663	663	+354		1,017	1,017	0
5025	Marley	944	813	+411		1,224	1,224	0
5028	Bilbrey	1,498	1,839		-927	912	1,353	+441
5029	McCombs	663	663		-247	416	416	0
5032	Davis	1,656	1,656		-654	1,002	1,002	0
5034	Seeligson	2,869	2,869		-1,337	1,532	2,420	888
5036	Cooper, C.	503	482	+329		811	811	0
5037	McCrea	2,907	2,315	+3		2,318	2,836	+518
5038	Graham, Ly.	1,608	2,698		-1,832	866	1,985	+1,119
5039	Sandhills	336	336		-144	192	192	0
5040	Harral	1,255	1,255		-327	928	1,045	+117
5044	Isler	297	186		-4	182	182	0
5047	Hilburn	314	314	+162		476	476	0
5049	Clemmons & Erdmann	840	840		-148	692	692	0
5051	Marley	2,882	2,713	+272		2,985	3,134	+149
5057	Tigner	228	228	+124		352	352	0
5058	Lynch	528	555		-266	289	583	+294
5062	Garnsey	720	710	+304		1,014	1,074	+60
5065	Graham, A.	972	898		-61	837	928	+91
5066	Spears	406	406	+55		461	699	+238
5068	Malstrom	2,145	2,145		-736	1,409	2,178	+769
5069	VHV Cattle	1,785	2,601		-947	1,654	2,325	+671
5072	Watson	1,654	879	+54		933	2,463	1,530
5073	Derrick, M.	521	521		-26	495	791	+296
5074	Barbe	1,050	1,050	+233		1,283	1,680	+397
5079	S & S Corp.	377	340		-163	177	461	+284
5082	Gomez	143	56		-16	40	137	+97
5083	Wilson	596	597		-407	190	940	+750

(A) - Allotments are numbered by county. Each county is usually numbered north to south (5000 Chaves County)
(6000 Lea County) (7000 Eddy County)
(B) - Grazing preference established from 1940 - 1941 range survey
(C) - Active licensed use is derived from the average use of 1975, 1976, and 1977
(D) - Columns 3 and 4 represent the increase or reduction of AUMs derived from the 1978 range survey
(E) - Net AUMs available for livestock after range survey adjustment
(F) - Livestock AUMs predicted from range site potential, vegetative treatments and grazing systems
(G) - Change in AUMs from 1978 to 2000
(H) - 6044 is included in other 6044
(I) - 6045 is included in top 6045
(J) - 7012 and 6049 present grazing preference are combined
(K) - 7037 and 7038 are combined under 7037
* - Licensed use is higher than preference in some instances because of temporary nonrenewable AUMs

TABLE C-3
PROJECTED AUMS ON PUBLIC LANDS WITH THE PROPOSED ACTION

(A)		(B)	(C)	(D)		(E)	(F)	(G)
Allot. No.	Name	Grazing Preference AUMS	Active License Use AUMS*	AUMS Change From License Increase	AUMS Change From License Reduction	Livestock AUMS Available (1978)	Livestock AUMS Available (2000)	Change From (1978) to (2000)
5084	Greenwood	1,683	1,412		-387	1,025	1,992	+967
5085	Taylor & Medlin	1,068	1,068		-458	610	1,189	+579
5088	Derrick & Merritt	1,458	502		-28	474	1,376	+902
5090	Sams & Dean	540	540		-227	313	528	+215
5091	Derrick, R.	338	333		-259	74	462	+388
5092	Merritt, Wm.	1,106	588	+177		765	1,024	+259
6004	Warren	444	444		-24	420	860	+440
6006	Caswell	2,400	1,786	+1,251		3,037	4,859	+1,822
6008	Linam	1,785	1,300		-319	981	986	+5
6009	Scharbauer	3,512	2,902	+474		3,376	4,120	+744
6011	Smith, M.	2,832	2,155		-757	1,398	1,760	+362
6020	Berry	3,553	3,334		-1,212	2,122	3,083	+961
6021	Smith, Wm.	3,617	3,215		-1,657	1,558	3,111	+1,553
6027	Merchant	2,968	2,968		-886	2,082	3,330	+1,248
6029	Ward	1,151	1,151		-469	682	887	+205
6030	Deep Well	612	612		-308	304	489	+185
6033	Dinwiddie	3,420	2,919		-941	1,978	5,146	+3,168
6035	Madera, R.	1,791	1,613	+157		1,770	2,834	+1,064
6042	Dublin	804	804		-467	337	1,002	+665
6043	Beckham	2,343	2,141		-308	1,833	3,746	+1,913
6044	Madera, M.	660	1,916	+878		202	556	+354
6044	Madera, M.	2,304	(H)	(H)		2,592	3,901	+1,309
6045	Madera, M. & K.	905	1,777		-354	333	1,506	+1,173
6045	Madera, M. & K.	3,029	(I)		(I)	1,090	4,408	+3,318
6045	Madera, M. & K.	2,640	2,237		-1,341	896	3,472	+2,576
6046	McDonald	857	706		-367	339	1,229	+890
7003	Holeman	567	567		-217	350	1,056	+706
7004	Martin	1,806	1,262		-30	1,232	4,464	+3,232
7005	Johnson, G.	278	221		-116	105	173	+68
7006	Gissler	672	672		-273	399	455	+56
7008	Williams	2,819	2,740		-1,454	1,286	5,211	+3,925
7011	Netherlin	923	923		-543	380	1,125	+745
7012	Snyder, L.T.D.	(J)21,319	21,141		-11,568	9,573	19,677	+10,104
7013	Slash X Ranch	10,200	7,365		-3,641	3,724	14,064	+10,340
7014	Stagner & Forehand	970	342	+229		571	1,465	+894
7015	Angel	1,507	1,507		-320	1,187	4,080	+2,893
7016	Fanning	1,215	1,134		-149	985	1,459	+474
7018	Clayton	420	377		-155	222	1,115	+893
7020	Spears, J.	2,362	1,933		-827	1,106	4,787	+3,681
7021	Campbell	2,274	1,959		-748	1,211	3,003	+1,792
7022	Key	6,324	6,332		-2,790	3,542	12,379	+8,337
7025	West	420	421	+16		437	1,579	+1,142
7026	Pue	564	418		-238	180	755	+575
7027	Smith	7,769	6,568		-2,719	3,849	14,741	+10,892
7028	Clark	1,173	1,174		-341	833	2,019	+1,186
7031	Grandi	2,789	2,766		-1,319	1,447	7,546	+6,099
7033	Mobley	1,953	1,309		-272	1,037	3,926	+2,889
7034	Greenwood	1,066	1,067		-685	382	1,817	+1,435
7035	J & M Farms	443	205	+228		433	1,498	+1,065
7037	Delaware	3,984	2,040		-382	-1,735	4,790	+3,055
7038	Delaware	192	192		-115	(K)	(K)	(K)
7039	Lindsay	2,957	2,957		-1,525	1,432	4,837	+3,405
7041	Johnson, W.	819	819		-361	458	1,936	+1,478
Subtotal 2		162,249	143,747	+5,753	-51,927	97,573	217,098	+119,525
No Specific Grazing Systems								
5001	Sea Cattle	660	660		-312	348	348	0
5002	GAiner	72	72		-47	25	25	0
5003	N. Plains Land & Inv.	40	40		-25	15	15	0
5004	Boone	768	768		-332	436	436	0
5006	Van Eaton	48	48		-37	11	11	0
5008	Van Eaton	490	410		-59	351	351	0
5009	Marley	624	552		-316	236	236	0
5011	Moorhead	516	516		-312	204	204	0
5013	Goods, Inc.	384	384		-202	182	182	0
5014	McDowell (east)	72	72		-54	18	18	0
5015	Southard, F.	36	36		-23	13	13	0
5016	Southard, T.	144	144		-27	117	117	0
5017	Southard, J.	60	60		-23	37	37	0
5022	Smith, H.	36	36	+43		79	79	0
5023	White	212	212		-43	169	169	0
5026	Faircloth	216	216		-2	214	214	0
5027	Nuckols	144	144		-95	49	49	0
5030	Jenkins	84	84		-38	46	46	0
5031	Huston	243	243		-33	210	210	0
5033	Cato	144	144		-53	91	91	0
5035	Whitelakes	192	192		-102	90	90	0
5039	Red Tank	16	16		-7	9	9	0

TABLE C-3
PROJECTED AUMS ON PUBLIC LANDS WITH THE PROPOSED ACTION

(A)		(B)	(C)	(D)		(E)	(F)	(G)
Allot. No.	Name	Grazing Preference AUMS	Active License Use AUMS*	AUMS Change From License		Livestock AUMS Available (1978)	Livestock AUMS Available (2000)	Change From (1978) to (2000)
				Increase	Reduction			
5039	Sherman Cattle	80	80		-34	46	46	0
5042	Glenn	108	108		-40	68	68	0
5045	Caprock Ranch	316	316		-181	135	135	0
5050	Clemmons & Erdman	468	468		-244	224	224	0
5052	Marley	12	12		-3	9	9	0
5054	Irvin	84	84	+45		129	129	0
5056	Graham, Li.	60	60	+27		87	87	0
5059	Wilson	228	228		-122	106	106	0
5060	Sallee	24	24	+7		31	31	0
5061	Woods	48	43	+40		83	83	0
5064	Lee	176	176		-67	109	109	0
5070	Miles	60	60		-8	52	52	0
5071	Glass	12	12		-1	11	11	0
5081	Greer	178	138		-27	111	111	0
5089	Medlin, B.	180	180		-120	60	60	0
5093	Haley	20	12		-8	4	4	0
6001	McCrory	12	12		-2	10	10	0
6002	Field	5	5		-1	4	4	0
6003	Taylor & Heidel	11	11		-5	6	6	0
6010	Snyder, L.T.D.	96	96		-46	50	50	0
6012	Sims	12	12		-10	2	2	0
6013	Klein	78	78		-38	40	40	0
6014	S & W Cattle	406	406		-323	83	83	0
6015	Kornegay	300	300		-228	72	72	0
6016	Terry	197	197		-122	75	75	0
6017	Hill	236	236		-197	39	39	0
6018	Turland	116	116		-59	57	57	0
6019	Cooper, D.	269	269		-203	66	66	0
6024	Wallach	23	23		-13	10	10	0
6025	Robinson	526	526		-289	237	237	0
6026	Robinson	180	180		-53	127	127	0
6028	Brininstool, Wm.	252	252		-173	79	79	0
6029	Ward	20	20		-16	4	4	0
6031	Goins	158	158		-85	73	73	0
6032	Winters	216	216		-169	47	47	0
6034	Wylie	408	408		-164	244	244	0
6035	Madera, R.	612	612		-14	598	598	0
6036	Madera, R.	24	24		-20	4	4	0
6041	Dinwiddie	48	48	+34		82	82	0
6047	Deck	490	490		-194	296	296	0
6048	Maddox	1,524	1,524		-726	798	798	0
6049	Snyder, L.T.D. (Hart)	(J)	713		-333	380	380	0
6050	Hilburn	12	12		-2	10	10	0
7001	Haven	264	176		-128	48	48	0
7002	Karr	120	120		-85	35	35	0
7009	Evans	96	96		-61	35	35	0
7010	Solt	347	347		-193	154	154	0
7017	Greenwood, H.	180	180		-146	34	34	0
7023	Beker, Ind.	156	104		-26	78	78	0
7024	Simpson	175	175		-39	136	136	0
7029	Bond	210	210		-52	158	158	0
7030	Tracy	84	84		-51	33	33	0
Subtotal 3		15,118	15,486	+196	-7,263	8,419	8,419	0
Subtotal 1		104,399	74,652	+2,528	-15,061	62,119	141,872	+79,753
Subtotal 2		162,249	143,747	+5,753	-51,927	97,573	217,098	+119,525
Subtotal 3		15,118	15,486	+196	-7,263	8,419	8,419	0
GRAND TOTAL		281,766	233,885	+8,477	-74,251	168,111	367,389	+199,278

(A) - Allotments are numbered by county. Each county is usually numbered north to south (5000 Chaves County) (6000 Lea County) (7000 Eddy County)
(B) - Grazing preference established from 1940 - 1941 range survey
(C) - Active licensed use is derived from the average use of 1975, 1976, and 1977
(D) - Columns 3 and 4 represent the increase or reduction of AUMs derived from the 1978 range survey
(E) - Net AUMs available for livestock after range survey adjustment
(F) - Livestock AUMs predicted from range site potential, vegetative treatments and grazing systems
(G) - Change in AUMs from 1978 to 2000
(H) - 6044 is included in other 6044
(I) - 6045 is included in top 6045
(J) - 7012 and 6049 present grazing preference are combined
(K) - 7037 and 7038 are combined under 7037
* - Licensed use is higher than preference in some instances because of temporary nonrenewable AUMs

APPENDIX
IV

APP IV

TABLE D-1
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
MECHANICAL ONLY
(Source: Roswell District Files and Soil Surveys: Chaves, Eddy, and Lea Counties)

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production: Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]		Total Potential AUMs	Total Existing AUMs[e]
				Acres	AUMs	Acres	AUMs	Acres	AUMs		
Existing Specific Grazing Systems											
5043	Sand Ranch	CP-2									
	Deep Sand		3,276			3,276	369			369	
	Sandy		714	680	227	34	3			230	
	Sand Hills		4,326			4,326	488			488	
	Limey		66			66	8			8	
	Shallow		13			13	1			1	
	Total		8,395	680	227	7,715	869			1,096	987
5046	Caprock Ranch	CP-2									
	Deep Sand		4,375			4,375	329			329	
	Sandy		196			196	17			17	
	Sand Hills		5,056			5,056	481			481	
	Limey		196			196	17			17	
	Total		9,823			9,823	844			844	844
5053	Culp, C.	SD-3									
	Sandy		150	150	50					50	
	Limey		60			60	9			9	
	Deep Sand	CP-2	8,973			8,973	1,279			1,279	
	Sand Hills		8,449			8,449	1,203			1,203	
	Active Duneland[f]		50			50	0			0	
	Total		17,682	150	50	17,532	2,491			2,541	2,512
5063	Culp, J.	CP-2									
	Deep Sand		754			754	94			94	
	Sandy		240			240	29			29	
	Bottomland		510			510	61			61	
	Sand Hills		1,400			1,400	172			172	
	Shallow		40			40	3			3	
	Total		2,944			2,944	359			359	359
5075	Bogle	SD-3									
	Deep Sand		37,731			37,731	3,753			3,753	
	Sandy		30,639	21,882	7,294	8,757	781			8,075	
	Bottomland		6,761	6,556	3,278	205	19			3,297	
	Limestone Hills		40			40	3			3	
	Loamy		24,782	18,357	4,589	1,510	156	4,915	1,229	5,974	
	Gyp Breaks-Hills		1,060			1,060	156			156	
	Gyp Uplands		17,711			12,714	1,407	4,997	714	2,121	
	Sand Hills		18,005			18,005	1,876			1,876	
	Gravelly		15,264			13,678	1,407	1,586	396	1,803	
	Loamy Sand		7,599	6,690	1,672	909	156			1,828	
	Salt Flats		7,520			7,520	0			0	
	Active Duneland[f]		439			439	0			0	
	Rocky Land[f]		1,760			1,760	0			0	
	Shallow Sand		14,356			14,356	1,563			1,563	
	Deep Sand	CP-2	17,700			17,700	1,876			1,876	
	Sandy		11,191	4,020	1,340	7,171	625			1,965	
	Sand Hills		16,359			16,359	1,719			1,719	
	Gravelly		558			558	54			54	
	Loamy Sand		702			702	67			67	
	Active Duneland[f]		100			100	0			0	
	Shallow Sand		225			225	21			21	
	Total		230,502	57,505	18,173	161,499	15,639	11,498	2,339	36,151	22,325
5077	Williams	CP-2									
	Sandy		3,190	1,590	530	1,600	174			704	
	Deep Sand		7,007			7,007	791			791	
	Sand Hills		8,631			8,631	965			965	
	Total		18,828	1,590	530	17,238	1,930			2,460	2,107
5078	Slash ML Ranch	CP-2									
	Deep Sand		2,947			2,947	291			291	
	Sandy		680	330	110	350	21			131	
	Sand Hills		2,427			2,427	241			241	
	Total		6,054	330	110	5,724	553			663	584
6007	Caviness	SD-3									
	Deep Sand		8,780			8,780	814			814	
	Sandy		2,845	1,595	532	1,250	108			640	
	Sand Hills		6,494			6,494	613			613	
	Gravelly		80			80	7			7	
	Loamy Sand		50	50	13					13	
	Active Duneland[f]		670			670	0			0	
	Total		18,919	1,645	545	17,274	1,542			2,087	1,688

[a] Range sites are listed by SCS major land resource areas (MLRA): SD3 = Southern Desert, CP2 = Pecos-Canadian Plains and Valleys, HP3 = Southern High Plains.

[b] Brush removal and proper management; forage production would approximate SCS projection for that range site in excellent condition by year 2000.

[c] Forage production by year 2000 should approximate existing production levels. However, without brush control production would be declining after year 2000.

[d] Grasslands with proper management should recover to SCS projection for that range site in excellent condition by year 2000.

[e] Data is from 1977 Range Survey.

[f] Designates land type.

TABLE D-1
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
MECHANICAL ONLY

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production: Brush Treatment[b] Acres	Brush Treatment[b] AUMs	No Brush Treatment[c] Acres	No Brush Treatment[c] AUMs	Grassland[d] Acres	Grassland[d] AUMs	Total Potential AUMs	Total Existing AUMs[e]
6022	Bingham	SD-3									
	Sandy		441	441	147					147	
	Gravelly		1,885			1,885	254			254	
	Loamy Sand		399					399	99	99	
	Waste[f]		540			540	0			0	
	Total		3,265	441	147	2,425	254	399	99	500	341
6028	Brininstool, W.	SD-3									
	Deep Sand		11,031			11,031	965			965	
	Sandy		515	440	171	75	10			181	
	Sand Hills		563			563	51			51	
	Total		12,109	440	171	11,669	1,026			1,197	1,064
6037	Diamond & Half, Inc.	SD-3									
	Deep Sand		14,132			14,132	2,121			2,121	
	Sandy		2,734	2,734	911					911	
	Sand Hills		1,392			1,392	212			212	
	Gravelly		4,298			4,298	636			636	
	Active Duneland[f]		1,633			1,633	0			0	
	Limey		354			354	61			61	
	Total		24,543	2,734	911	21,809	3,030			3,941	3,409
6038	James	SD-3									
	Deep Sand		18,770			18,770	3,813			3,813	
	Sandy		4,723	4,723	1,574					1,574	
	Sand Hills		1,218			1,218	249			249	
	Gravelly		390			390	83			83	
	Active Duneland[f]		215			215	0			0	
	Total		25,316	4,723	1,574	20,593	4,145			5,719	5,095
6039	Robbins	SD-3									
	Deep Sand		5,560			5,560	744			744	
	Sandy		1,139	860	286	279	40			326	
	Sand Hills		88			88	10			10	
	Gravelly		1,351			1,351	178			178	
	Loamy Sand		155			155	20			20	
	Hills & Breaks		630			630	0			0	
	Active Duneland[f]		1,575			1,575	0			0	
	Total		10,498	860	286	9,638	992			1,278	1,080
6040	Brininstool, C.	SD-3									
	Deep Sand		4,307			4,307	659			659	
	Sandy		255	255	85					85	
	Sand Hills		280			280	43			43	
	Gravelly		150			150	22			22	
	Active Duneland[f]		1,759			1,759	0			0	
	Total		6,751	255	85	6,496	724			809	752
7007	Haines	SD-3									
	Deep Sand		2,321			2,321	219			219	
	Sandy		550			550	53			53	
	Sand Hills		1,848			1,848	174			174	
	Total		4,719			4,719	446			446	446
7019	Rains	SD-3									
	Deep Sand		397			397	20			20	
	Sandy		1,655	1,547	515			108	36	551	
	Loamy		1,416	450	112			966	241	353	
	Gyp Upland		2,945			2,139	109	806	115	224	
	Sand Hills		18			18	1			1	
	Total		6,431	1,997	627	2,554	130	1,880	392	1,149	326
7032	Sanders	SD-3									
	Deep Sand		42,105			42,105	5,805			5,805	
	Sandy		7,138	7,138	2,379					2,379	
	Bottomland		512			512	77			77	
	Sand Hills		12,045			12,045	1,704			1,704	
	Gravelly		852			852	154			154	
	Loamy Sand		85	85	21					21	
	Hills & Breaks		100			100	0			0	
	Active Duneland[f]		3,320			3,320	0			0	
	Limey		54			54	7			7	
	Total		66,211	7,223	2,400	58,988	7,747			10,147	8,694
7036	Madera & McDonald	SD-3									
	Deep Sand		8,143			8,143	827			827	
	Sandy		2,970	2,970	990					990	
	Bottomland		44	44	22					22	
	Loamy		485	485	121					121	
	Gyp Uplands		30			30	3			3	
	Sand Hills		5,168			5,168	518			518	
	Gravelly		1,316			1,316	133			133	
	Hills & Breaks		830			830	0			0	
	Rocky Lands[f]		110			110	0			0	
	Total		19,096	3,499	1,133	15,597	1,481			2,614	1,813

TABLE D-1
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
MECHANICAL ONLY

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production						Total Potential AUMs	Total Existing AUMs[e]
				Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]			
				Acres	AUMs	Acres	AUMs	Acres	AUMs		
7040	Jackson	SD-3									
	Deep Sand		17,153			17,153	1,800			1,800	
	Sandy		21,745	21,745	7,247					7,247	
	Bottomland		7,265	7,265	3,632					3,632	
	Gyp Uplands		108			108	11			11	
	Sand Hills		70			70	7			7	
	Gravelly		6,734			6,734	707			707	
	Hills & Breaks		350			350	0			0	
	Total		53,425	29,010	10,879	24,415	2,525			13,404	5,525
7042	Twin Wells	SD-3									
	Deep Sand		23,646			23,646	2,743			2,743	
	Sandy		9,441	8,663	2,887	778	97			2,984	
	Bottomland		1,704	1,704	852					852	
	Sand Hills		1,974			1,974	220			220	
	Gravelly		680			680	94			94	
	Total		37,445	10,367	3,739	27,078	3,154			6,893	4,362
Subtotal			582,956	123,449	41,587	445,730	49,881	13,777	2,830	94,298	64,313
Proposed Specific Grazing Systems											
5005	Denton	CP-2									
	Deep Sand		3,359			2,064	151	1,295	431	582	
	Sandy		1,368			998	108	370	123	231	
	Loamy		62			62	3			3	
	Sand Hills		1,430			1,245	84	185	61	145	
	Shallow		2			2	3			3	
	Total		6,221			4,371	349	1,850	615	964	722
5007	Cooper, M.	CP-2									
	Deep Sand		84			84	13			13	
	Sandy		1,742	1,742	581					581	
	Loamy		54	54	18					18	
	Gyp Uplands		85			85	13			13	
	Gravelly		198			198	24			24	
	Loamy Sand		85	85	28					28	
	Hills & Breaks		142			142	0			0	
	Shallow		36			36	6			6	
	Riparian[f]		100			100	30			30	
	Bottomland	SD-3	60	60	30					30	
	Gyp Breaks - Hills		290			290	40			40	
	Total		2,876	1,941	657	935	126			783	555
5010	Moorhead	CP-2									
	Deep Sand		1,413			1,413	151			151	
	Sand Hills		1,065			1,065	142			142	
	Total		2,478			2,478	293			293	293
5012	Moorhead	CP-2									
	Deep Sand		2,547			2,367	357	180	45	402	
	Sandy		190			190	39			39	
	Sand Hills		988			988	144			144	
	Limey		38			38	6			6	
	Shallow		38			38	6			6	
	Total		3,801			3,621	552	180	45	597	575
5014	McDowell - West	CP-2									
	Deep Sand		831			831	50			50	
	Sandy		744			744	72			72	
	Sand Hills		273			273	16			16	
	Shallow		42			42	3			3	
	Total		1,890			1,890	141			141	141
5018	Bilberry	CP-2									
	Deep Sand		1,511			1,511	114			114	
	Sand Hills		2,057			2,057	188			188	
	Sandy	HP-3	280			280	33			33	
	Loamy		3			3	0			0	
	Shallow		7			7	0			0	
	Total		3,858			3,858	335			335	335
5019	Cooper, M.	CP-2									
	Deep Sand		1,366			1,366	259			259	
	Sandy		1,281	1,281	427					427	
	Gravelly		586			586	112			112	
	Hills & Breaks		364			364	0			0	
	Total		3,597	1,281	427	2,316	371			798	576

TABLE D-1
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
MECHANICAL ONLY

				Potential Production							
Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]		Total Potential AUMs	Total Existing AUMs[e]
				Acres	AUMs	Acres	AUMs	Acres	AUMs		
5020	Sturgeon	SD-3									
	Bottomland		500	475	238	25	2			240	
	Gyp Breaks-Hills		1,220			1,220	160			160	
	Riparian[f]		260			260	33			33	
	Deep Sand	CP-2	152			152	19			19	
	Sandy		1,654	1,654	538					538	
	Gravelly		480			480	65			65	
	Hills & Breaks		320			320	0			0	
	Shallow		27			27	2			2	
	Total		4,613	2,129	776	2,484	281			1,057	627
5021	Wagner	CP-2									
	Deep Sand		1,221			1,221	227			227	
	Sandy		1,615	1,615	538					538	
	Loamy		500	500	167					167	
	Sand Hills		319			319	63			63	
	Gravelly		78			78	15			15	
	Hills & Breaks		53			53	0			0	
	Total		3,786	2,115	705	1,671	305			1,010	716
5024	Durham	SD-3									
	Bottomland		70	70	35					35	
	Gyp Breaks-Hills		90			70	10	20	11	21	
	Deep Sand	CP-2	300			174	25	126	71	96	
	Sandy		1,662	1,548	516			114	64	580	
	Loamy		585	573	191			12	7	198	
	Gyp Upland		877			857	123	20	10	133	
	Total		3,584	2,191	742	1,101	158	292	163	1,063	1,063
5025	Marley	SD-3									
	Gyp Upland		380			380	33			33	
	Loamy Sand		380	200	50			180	36	86	
	Deep Sand	CP-2	952			841	223	111	38	261	
	Sandy		1,203	1,203	401					401	
	Loamy		174	174	58					58	
	Gyp Upland		108			108	9			9	
	Gravelly		342			342	85			85	
	Loamy Sand		592	592	197					197	
	Hills & Breaks		158			158	0			0	
	Limey		376			376	100			100	
	Shallow		133			133	0			0	
	Total		4,798	2,169	706	2,338	450	291	74	1,230	1,286
5028	Bilbrey	CP-2									
	Deep Sand		3,318			3,318	460			460	
	Sandy		1,450	928	309	140	20	382	127	456	
	Loamy		102	102	34					34	
	Limey		30					30	10	10	
	Shallow		1,930			1,930	270			270	
	Total		6,830	1,030	343	5,388	750	412	137	1,230	950
5029	McCombs	CP-2									
	Deep Sand		1,641			1,641	244			244	
	Sandy		129			129	22			22	
	Sand Hills		1,150			1,150	170			170	
	Limey		11			11	1			1	
	Total		2,931			2,931	437			437	437
5032	Davis	HP-3									
	Deep Sand		810			810	91			91	
	Sandy		30			30	5			5	
	Limey		210			210	32			32	
	Deep Sand	CP-2	3,808			3,808	438			438	
	Sandy		433			433	78			78	
	Sand Hills		3,188			3,188	448			448	
	Total		8,479			8,479	1,092			1,092	1,092
5034	Seeligson	CP-2									
	Deep Sand		4,236			4,236	518			518	
	Sandy		2,728	1,444	481	880	105	404	135	721	
	Sand Hills		4,418			4,418	528			528	
	Limey		236			88	13	148	49	62	
	Shallow		1,244			1,244	145			145	
	Sandy Loam		60			60	13			13	
	Total		12,922	1,444	481	10,926	1,322	552	184	1,987	1,563
5036	Cooper, C.	CP-2									
	Sandy		1,042	1,042	357					357	
	Loamy		560	560	196					196	
	Gyp Upland		408			408	81			81	
	Gravelly		150			150	29			29	
	Hills & Breaks		100			100	0			0	
	Shallow		361			361	71			71	

TABLE D-1
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
MECHANICAL ONLY

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production: Brush Treatment[b] Acres	Brush Treatment[b] AUMs	No Brush Treatment[c] Acres	No Brush Treatment[c] AUMs	Grassland[d] Acres	Grassland[d] AUMs	Total Potential AUMs	Total Existing AUMs[e]
5036	Cooper, C. (continued)										
	Sandy	SD-3	15	15	5					5	
	Loamy		6	6	1					1	
	Gyp Breaks-Hills		70			70	7			7	
	Gyp Upland		204			204	26			26	
	Loamy Sand		195	195	71					71	
	Total		3,111	1,818	630	1,293	214			844	851
5037	McCrea	SD-3									
	Deep Sand		147			147	26			26	
	Sandy		148	140	46			8	2	48	
	Gyp Breaks-Hills		1,084			120	13	964	107	120	
	Gyp Uplands		4,720			1,300	185	3,420	502	687	
	Sand Hills		273			273	53	0	0	53	
	Loamy Sand		4,691	1,300	325			3,391	872	1,197	
	Shallow		222			210	37	12	3	40	
	Sandy	CP-2	842	842	280					280	
	Loamy		858	858	286					286	
	Gravelly		204			204	37			37	
	Hills & Breaks		136			136	0			0	
	Shallow		572			572	106			106	
	Total		13,897	3,140	937	2,962	457	7,795	1,486	2,880	2,489
5038	Graham, Ly.	CP-2									
	Deep Sand		7,475			7,185	791	290	72	863	
	Sandy		80	80	26					26	
	Sand Hills		393			393	42			42	
	Total		7,948	80	26	7,578	833	290	72	931	873
5039	Sand Hills	CP-2									
	Bottomlands		855			855	160			160	
	Sand Hills		735			735	116			116	
	Total		1,590			1,590	276			276	276
5040	Harral	CP-2									
	Sandy		20					20	7	7	
	Shallow		30					30	7	7	
	Sandy	SD-3	60					60	22	22	
	Bottomland		10					10	5	5	
	Gyp Breaks-Hills		900					900	120	120	
	Gyp Uplands		2,288			50	2	2,238	348	350	
	Gravelly		100			60	7	40	10	17	
	Loamy Sand		2,188			50	6	2,138	562	568	
	Active Duneland[f]		15					15	0	0	
	Shallow		90					90	26	26	
	Total		5,701			160	15	5,541	1,107	1,122	1,005
5044	Isler	CP-2									
	Deep Sand		308			308	33			33	
	Sandy		72			72	13			13	
	Sand Hills		893			893	124			124	
	Limey		88			88	13			13	
	Total		1,361			1,361	183			183	183
5047	Hilburn	HP-3									
	Deep Sand		1,075			1,075	238			238	
	Sandy		10			10	2			2	
	Sand Hills		1,165			1,165	256			256	
	Total		2,250			2,250	496			496	496
5049	Clemmons & Erdmann	CP-2									
	Deep Sand		2,213			2,213	290			290	
	Sandy		18			18	2			2	
	Sand Hills		3,175			3,175	410			410	
	Limey		22			22	3			3	
	Total		5,428			5,428	705			705	705
5051	Marley	CP-2									
	Deep Sand		7,156			7,156	1,285			1,285	
	Sand Hills		240			240	30			30	
	Bottomland		90	90	90					90	
	Loamy		20			20	3			3	
	Sand Hills		10,246			10,246	1,818			1,818	
	Total		17,752	90	90	17,662	3,136			3,226	3,152
5057	Tigner	SD-3									
	Salty Bottomland		80					80	28	28	
	Bottomland		30					30	15	15	
	Gyp Breaks-Hills		145					145	36	36	
	Gyp Upland		88					88	25	25	
	Gravelly		335					335	99	99	
	Loamy Sand		546					546	165	165	
	Total		1,224					1,224	368	368	368

TABLE D-1
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
MECHANICAL ONLY

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production						Total Potential AUMs	Total Existing AUMs[e]
				Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]			
				Acres	AUMs	Acres	AUMs	Acres	AUMs		
5058	Lynch	SD-3									
	Gyp Breaks-Hills		170					170	19	19	
	Gyp Upland		1,276					1,276	182	182	
	Loamy Sand		1,679					1,679	420	420	
	Total		3,125					3,125	621	621	327
5062	Garnsey	SD-3									
	Deep Sand		248			248	70			70	
	Sandy		370	370	123					123	
	Salty Bottomland		80					80	33	33	
	Gyp Breaks-Hills		80					80	9	9	
	Gyp Uplands		192			105	15	87	12	27	
	Gravelly		720			6	0	714	190	190	
	Loamy Sand		2,493	439	109			2,054	542	651	
	Hills & Breaks		60			60	0			0	
	Shallow Sand		30			30	8			8	
	Total		4,273	809	232	449	93	3,015	786	1,111	1,066
5065	Graham, A.	CP-2									
	Deep Sand		1,648			1,648	269			269	
	Sandy		840	310	103	530	87			190	
	Sand Hills		3,031			3,031	504			504	
	Active Dunes[f]		540			540	0			0	
	Hills & Breaks	HP-3	35			35	0			0	
	Shallow		30			30	9			9	
	Total		6,124	310	103	5,814	869			972	915
5066	Spears	CP-2									
	Deep Sand		151			151	32			32	
	Sandy		1,860	1,610	536	250	53			589	
	Sand Hills		279			279	61			61	
	Hills & Breaks		80			80	0			0	
	Shallow		140			140	30			30	
	Loamy		4			4	1			1	
	Very Shallow		6			6	1			1	
	Total		2,520	1,610	536	910	178			714	494
5068	Malstrom	CP-2									
	Deep Sand		8,359			8,359	890			890	
	Sand Hills		1,530			1,530	163			163	
	Limey		60			60	6			6	
	Shallow Sand		90			90	10			10	
	Deep Sand	SD-3	292			292	31			31	
	Sandy		1,894	1,426	475	468	50			525	
	Sand Hills		46			46	5			5	
	Limey		110			110	12			12	
	Shallow Sand		1,342			1,342	143			143	
	Total		13,723	1,426	475	12,297	1,310			1,785	1,462
5069	VHV Cattle	SD-3									
	Deep Sand		168			168	29			29	
	Sandy		718	252	84	40	7	426	142	233	
	Salty Bottomland		20					20	6	6	
	Bottomland		70	20	10			50	25	35	
	Gyp Breaks-Hills		1,452			100	17	1,352	150	167	
	Gyp Uplands		953			159	28	794	113	141	
	Gravelly		4,328			3,020	525	1,308	327	852	
	Loamy Sand		2,921	1,319	329	112	20	1,490	372	721	
	Hills & Breaks		480			480	0			0	
	Total		11,110	1,591	423	4,079	626	5,440	1,135	2,184	1,706
5072	Watson	SD-3									
	Deep Sand		180			163	39	17	5	44	
	Sandy		6,084	5,917	1,972			167	55	2,027	
	Bottomland		20	20	10					10	
	Gyp Breaks & Hills		153					153	17	17	
	Gyp Uplands		151			28	7	123	18	25	
	Gravelly		396			373	90	23	6	96	
	Loamy Sand		865	619	154			246	61	215	
	Hills & Breaks		770			770	0			0	
	Shallow Sand		60			60	15			15	
	Total		8,679	6,556	2,136	1,394	151	729	162	2,449	939
5073	Derrick, M.	CP-2									
	Deep Sand		1,530			1,530	258			258	
	Sandy		180	180	60					60	
	Sand Hills		816			816	137			137	
	Shallow Sand		250			250	42			42	
	Sandy	SD-3	170	170	56					56	
	Loamy Sand		10	10	2					2	
	Total		2,956	360	118	2,596	437			555	498

TABLE D-1
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
MECHANICAL ONLY

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production: Brush Treatment[b] Acres	Potential Production: Brush Treatment[b] AUMs	Potential Production: No Brush Treatment[c] Acres	Potential Production: No Brush Treatment[c] AUMs	Potential Production: Grassland[d] Acres	Potential Production: Grassland[d] AUMs	Total Potential AUMs	Total Existing AUMs[e]
5074	Barbe	SD-3									
	Deep Sand		96			96	17			17	
	Sandy		944	310	103	634	112			215	
	Gravelly		300			300	53			53	
	Limey		20			20	4			4	
	Shallowsand		30			30	5			5	
	Deep Sand	CP-2	3,306			3,306	584			584	
	Sandy		670	450	150	220	39			189	
	Sand Hills		1,927			1,927	341			341	
	Total		7,293	760	253	6,533	1,155			1,408	1,289
5079	S & S Corp.	CP-2									
	Deep Sand		1,760			1,760	132			132	
	Sandy		240	140	46	100	7			53	
	Sand Hills		557			557	42			42	
	Total		2,557	140	46	2,417	181			227	191
5082	Gomez	SD-3									
	Sandy		50	50	16					16	
	Gravelly		349			349	23			23	
	Loamy Sand		20	20	5					5	
	Hills & Breaks		130			130	0			0	
	Shallow Sands		50			50	3			3	
	Shallow		190			190	13			13	
	Total		789	70	21	719	39			60	43
5083	Wilson	SD-3									
	Deep Sand		428			428	27			27	
	Sandy		986	940	313	46	3			316	
	Salty Bottomland		50			50	3			3	
	Bottomland		30			30	2			2	
	Gravelly		384			384	25			25	
	Loamy Sand		90	90	22					22	
	Hills & Breaks		270			270	0			0	
	Shallow Sand		1,205			1,205	77			77	
	Total		3,443	1,030	335	2,413	137			472	196
5084	Greenwood	SD-3									
	Deep Sand		560			560	76			76	
	Sandy		840	840	280					280	
	Salty Bottomland		90	90	30					30	
	Bottomland		60	40	20			20	10	30	
	Gyp Breaks/Hills		280			220	29	60	7	36	
	Gyp Uplands		1,355			1,190	168	165	24	192	
	Gravelly		2,124			2,124	289			289	
	Loamy Sand		2,548	2,383	595			165	41	636	
	Hills & Breaks		72			72	0			0	
	Shallow Sand		220			220	29			29	
	Total		8,149	3,353	925	4,386	591	410	82	1,598	1,097
5085	Taylor & Medlin	CP-2									
	Deep Sand		635			635	72			72	
	Sandy		2,234	1,354	451	880	104			555	
	Sand Hills		585			585	68			68	
	Shallow Sand		710			710	81			81	
	Loamy	HP-3	405	215	72	190	22			94	
	Hills & Breaks		260			260	0			0	
	Very Shallow		875			875	108			108	
	Total		5,704	1,569	523	4,135	455			978	627
5088	Derrick & Merritt	SD-3									
	Deep Sand		230			190	15	40	13	28	
	Sandy		230	135	45	60	4	35	12	61	
	Salty Bottomland		30	10	3	20	2			5	
	Bottomland		110	90	45	20	2			47	
	Gyp Breaks/Hills		100			100	8			8	
	Gyp Uplands		1,222			822	66	400	57	123	
	Gravelly		1,428			1,428	117			117	
	Loamy Sand		2,770	1,234	308	36	2	1,500	375	685	
	Hills & Breaks		170			170	0			0	
	Total		6,290	1,469	401	2,846	216	1,975	457	1,074	479
5090	Sams & Dean	CP-2									
	Deep Sand		626			626	62			62	
	Sandy		1,203	830	276	373	36			312	
	Sand Hills		868			868	88			88	
	Gravelly		150			150	16			16	
	Shallow Sand		250			250	25			25	
	Loamy	HP-3	18			18	2			2	
	Very Shallow		22			22	2			2	
	Total		3,137	830	276	2,307	231			507	314

TABLE D-1
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
MECHANICAL ONLY

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production						Total Potential AUMs	Total Existing AUMs[e]
				Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]			
				Acres	AUMs	Acres	AUMs	Acres	AUMs		
5091	Derrick, R.	SD-3									
	Deep Sand		104			104	4			4	
	Sandy		188	156	52	32	1			53	
	Salty Bottomland		20			20	1			1	
	Bottomland		200	200	100					100	
	Gyp Uplands		352			352	17			17	
	Gravelly		200			152	8	48	12	20	
	Loamy Sand		634	592	148	2	0	40	10	158	
	Total		1,698	948	300	662	31	88	22	353	79
5092	Merritt, Wm.	SD-3									
	Deep Sand		230			130	21	100	33	54	
	Sandy		180			180	27			27	
	Loamy		2,583			1,693	277	890	222	499	
	Gyp Uplands		1,746			1,276	208	470	67	275	
	Hills & Breaks		475			325	0	150	0	0	
	Total		5,214			3,604	533	1,610	322	855	770
6004	Warren	SD-3									
	Deep Sand		1,991			1,991	330			330	
	Sandy		180	180	60					60	
	Sand Hills		420			420	68			68	
	Active Duneland[f]		425			425	0			0	
	Total		3,016	180	60	2,836	398			458	423
6006	Caswell	SD-3									
	Deep Sand		6,573			6,573	1,380			1,380	
	Sandy		250	250	83					83	
	Loamy		80	80	20					20	
	Sand Hills		7,730			7,730	1,618			1,618	
	Hills & Breaks		40			40	0			0	
	Active Duneland[f]		2,976			2,976	0			0	
	Total		17,649	330	103	17,319	2,998			3,101	3,055
6008	Linam	SD-3									
	Deep Sand		4,620			4,620	454			454	
	Sandy		50			50	5			5	
	Sand Hills		5,435			5,435	533			533	
	Active Duneland[f]		946			946	0			0	
	Total		11,051			11,051	992			992	992
6009	Scharbauer	SD-3									
	Deep Sand		4,182			3,927	659	255	85	744	
	Sandy		354	329	109	25	4			113	
	Sand Hills		8,761			8,506	1,445	255	85	1,530	
	Gravelly		298			298	66			66	
	Loamy Sand		20			20	4			4	
	Active Duneland[f]		6,243			6,243	1,095			1,095	
	Limey		48			48	8			8	
	Deep Sand	HP-3	30			30	5			5	
	Sandy		40			40	5			5	
	Sand Hills		30			30	5			5	
	Active Duneland[f]		10			10	0			0	
	Total		20,016	329	109	19,177	3,296	510	170	3,575	3,438
6011	Smith, M.	SD-3									
	Deep Sand		7,159			7,139	707	20	7	714	
	Sandy		748			278	28	470	156	184	
	Gyp Uplands		27			12	1	15	2	3	
	Sand Hills		4,296			4,296	426			426	
	Loamy Sand		63			28	3	35	9	12	
	Active Duneland[f]		1,970			1,970	195			195	
	Limey		12			12	1			1	
	Total		14,275			13,735	1,361	540	174	1,535	1,414
6020	Berry	SD-3									
	Deep Sand		9,141			9,141	1,380			1,380	
	Sandy		2,660			2,660	401			401	
	Sand Hills		1,837			1,837	277			277	
	Gravelly		622			622	94			94	
	Active Duneland[f]		1,561			1,561	0			0	
	Total		15,821			15,821	2,152			2,152	2,152
6021	Smith, Wm.	SD-3									
	Deep Sand		6,310			6,310	757			757	
	Sandy		3,763			3,763	452			452	
	Bottomland		30			30	4			4	
	Sand Hills		583			583	70			70	
	Gravelly		2,183			2,183	262			262	
	Loamy Sand		35			35	4			4	
	Active Duneland[f]		1,315			1,315	0			0	
	Limey		180			180	21			21	
	Total		14,399			14,399	1,570			1,570	1,570

TABLE D-1
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
MECHANICAL ONLY

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production						Total Potential AUMs	Total Existing AUMs[e]
				Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]			
				Acres	AUMs	Acres	AUMs	Acres	AUMs		
6027	Merchant	SD-3									
	Deep Sand		6,252			6,252	1,043			1,043	
	Sandy		3,094			3,094	516			516	
	Sand Hills		2,668			2,668	445			445	
	Gravelly		446			446	74			74	
	Loamy Sand		170			170	28			28	
	Hills & Breaks		60			60	0			0	
	Active Duneland[f]		1,866			1,866	0			0	
	Total		14,556			14,556	2,106			2,106	2,106
6029	Ward	SD-3									
	Deep Sand		1,864			1,864	279			279	
	Sandy		796			260	39	536	179	218	
	Sand Hills		2,019			2,019	302			302	
	Active Duneland[f]		2,324			2,324	0			0	
	Limey		174					174	58	58	
	Total		7,177			6,467	620	710	237	857	688
6030	Deepwell	SD-3									
	Deep Sand		720			720	98			98	
	Sandy		10			10	1			1	
	Sand Hills		1,543			1,543	209			209	
	Active Duneland[f]		1,553			1,553	0			0	
	Total		3,826			3,826	308			308	308
6033	Dinwiddie	SD-3									
	Deep Sand		12,535			12,535	1,598			1,598	
	Sandy		870			870	111			111	
	Sand Hills		1,000			1,000	127			127	
	Gravelly		1,390			1,390	177			177	
	Active Duneland[f]		955			955	0			0	
	Total		16,750			16,750	2,013			2,013	2,013
6035	Madera, R.	SD-3									
	Deep Sand		6,254			6,254	1,148			1,148	
	Sandy		341			341	62			62	
	Sand Hills		2,392			2,392	439			439	
	Gravelly		670			670	123			123	
	Active Duneland[f]		649			649	0			0	
	Total		10,306			10,306	1,772			1,772	1,772
6042	Dublin	SD-3									
	Deep Sand		1,096			1,096	110			110	
	Sandy		30			30	3			3	
	Sand Hills		2,244			2,244	224			224	
	Active Duneland[f]		3,371			3,371	0			0	
	Total		6,741			6,741	337			337	337
6043	Beckham	SD-3									
	Deep Sand		10,276			10,276	1,656			1,656	
	Sandy		380			380	61			61	
	Sand Hills		720			720	116			116	
	Active Duneland[f]		1,811			1,811	0			0	
	Total		13,187			13,187	1,833			1,833	1,833
6044(W)	Madera, M.	SD-3									
	Deep Sand		1,455			1,455	115			115	
	Sandy		695			695	55			55	
	Gravelly		166			166	13			13	
	Loamy Sand		485			485	39			39	
	Hills & Breaks		518			518	0			0	
	Active Duneland[f]		340			340	0			0	
	Total		3,659			3,659	222			222	222
6044(E)	Madera, M.	SD-3									
	Deep Sand		10,513			10,513	2,323			2,323	
	Sandy		852			852	188			188	
	Gyp Uplands		3			3	1			1	
	Sand Hills		256			256	57			57	
	Gravelly		70			70	15			15	
	Loamy Sand		7			7	1			1	
	Active Duneland[f]		1,578			1,578	0			0	
	Limey		30			30	7			7	
	Total		13,309			13,309	2,592			2,592	2,592
6045(E)	Madera, M. & K.	SD-3									
	Deep Sand		4,523			4,523	334			334	
	Gravelly		10			10	1			1	
	Active Duneland[f]		235			235	0			0	
	Total		4,768			4,768	335			335	335

TABLE D-1
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
MECHANICAL ONLY

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production						Total Potential AUMs	Total Existing AUMs[e]
				Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]			
				Acres	AUMs	Acres	AUMs	Acres	AUMs		
6045	Madera, M. & K.	SD-3									
(SW)	Deep Sand		7,883			7,883	665			665	
	Sandy		3,796			3,796	320			320	
	Bottomland		12			12	1			1	
	Gravelly		1,980			1,980	167			167	
	Loamy Sand		110			110	9			9	
	Hills & Breaks		190			190	0			0	
	Active Duneland[f]		830			830	0			0	
	Total		14,801			14,801	1,162			1,162	1,162
6045	Madera, M. & K.	SD-3									
(NW)	Deep Sand		6,544			6,544	575			575	
	Sandy		2,768			2,768	243			243	
	Bottomland		392			392	35			35	
	Sand Hills		560			560	49			49	
	Active Duneland[f]		105			105	0			0	
	Total		10,369			10,369	902			902	902
6046	McDonald	SD-3									
	Deep Sand		3,158			3,158	283			283	
	Sandy		220			220	20			20	
	Sand Hills		60			60	6			6	
	Gravelly		270			270	24			24	
	Loamy Sand		70			70	6			6	
	Hills & Breaks		30			30	0			0	
	Active Duneland [f]		1,203			1,203	0			0	
	Total		5,011			5,011	339			339	339
7003	Holeman	SD-3									
	Deep Sand		1,214			1,214	135			135	
	Sandy		560			560	63			63	
	Sand Hills		1,408			1,408	157			157	
	Hills & Breaks		20			20	0			0	
	Total		3,202			3,202	355			355	355
7004	Martin	SD-3									
	Deep Sand		7,058			7,058	621			621	
	Sandy		762			762	67			67	
	Bottomland		6			6	0			0	
	Loamy		1,224			1,224	108			108	
	Sand Hills		5,315			5,315	467			467	
	Total		14,365			14,365	1,263			1,263	1,263
7005	Johnson, G.	SD-3									
	Salty Bottomland		30					30	10	10	
	Bottomland		60			60	4			4	
	Loamy		84			84	5			5	
	Gyp Breaks/Hills		790			690	42	100	14	56	
	Gyp Upland		782			682	42	100	11	53	
	Total		1,746			1,516	93	230	35	128	107
7006	Gissler	SD-3									
	Sandy		8			8	1			1	
	Loamy		787			787	91			91	
	Gyp Breaks/Hills		1,973			1,973	229			229	
	Gyp Upland		700			700	81			81	
	Gravelly		20			20	2			2	
	Total		3,488			3,488	404			404	404
7008	Williams	SD-3									
	Deep Sand		8,493			8,493	629			629	
	Sandy		814			814	61			61	
	Loamy		1,245			1,245	92			92	
	Sand Hills		7,671			7,671	568			568	
	Loamy Sand		85			85	6			6	
	Hills & Breaks		60			60	0			0	
	Active Duneland[f]		890			890	0			0	
	Rocky Land[f]		35			35	0			0	
	Total		19,293			19,293	1,356			1,356	1,356
7011	Netherlin	SD-3									
	Loamy		3,068			2,503	179	565	141	320	
	Gyp Breaks/Hills		950			50	3	900	100	103	
	Gyp Uplands		472			92	7	380	54	61	
	Gravelly		768			768	55			55	
	Hills & Breaks		155					155	0	0	
	Total		5,413			3,413	244	2,000	295	539	387

TABLE D-1
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
MECHANICAL ONLY

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production						Total Potential AUMs	Total Existing AUMs[e]
				Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]			
				Acres	AUMs	Acres	AUMs	Acres	AUMs		
7012	Snyder, L.T.D.	SD-3									
	Deep Sand		43,651			43,205	3,757	446	148	3,905	
	Sandy		21,018			18,509	1,609	2,509	836	2,445	
	Bottomland		4,508			4,257	370	251	125	495	
	Loamy		11,303			5,303	461	6,000	1,500	1,961	
	Gyp Breaks/Hills		1,547			674	59	873	97	156	
	Gyp Uplands		5,940			4,940	429	1,000	143	572	
	Sand Hills		23,240			23,240	2,021			2,021	
	Gravelly		3,564			3,368	293	196	49	342	
	Loamy Sand		772			494	43	278	69	112	
	Hills & Breaks		250			250	0			0	
	Active Duneland[f]		1,025			1,025	0			0	
	Rocky Land[f]		360			360	0			0	
	Limey		486			486	42			42	
	Badland[f]		50			50	0			0	
	Waste[f]		3,873			3,873				0	
	Total		121,587			110,034	9,084	11,553	2,967	12,051	10,038
7013	Slash X Ranch	SD-3									
	Deep Sand		16,131			14,971	1,209	1,160	386	1,595	
	Sandy		15,906	12,041	4,014	2,649	214	1,216	405	4,633	
	Bottomland		582	571	286	11	1			287	
	Loamy		1,298	544	136			754	188	324	
	Gyp Breaks/Hills		450			450	36			36	
	Gyp Uplands		515			36	3	479	68	71	
	Sand Hills		8,627			8,627	697			697	
	Gravelly		5,425			4,825	390	600	150	540	
	Loamy Sand		140	50	12			90	22	34	
	Hills & Breaks		70			70	0			0	
	Active Duneland[f]		1,020			1,020	0			0	
	Limey		6			6	0			0	
	Badland[f]		110			110	0			0	
	Total		50,280	13,206	4,448	32,775	2,550	4,299	1,219	8,217	3,912
7014	Stagner & Forehand	SD-3									
	Deep Sand		1,110			1,110	107			107	
	Sandy		652	652	217					217	
	Bottomland		28	28	14					14	
	Loamy		2,528	336	84			2,192	548	632	
	Gyp Uplands		1,685			224	22	1,461	209	231	
	Total		6,003	1,016	315	1,334	129	3,653	757	1,201	580
7015	Angell	SD-3									
	Deep Sand		4,126			3,830	362	296	99	461	
	Sandy		4,524	4,003	1,334			521	174	1,508	
	Bottomland		1,602	1,244	622			358	179	801	
	Loamy		1,182	630	158			552	138	296	
	Gyp Uplands		788			420	40	368	52	92	
	Sand Hills		210			210	20			20	
	Gravelly		293			165	15	128	32	47	
	Total		12,725	5,877	2,114	4,625	437	2,223	674	3,225	1,203
7016	Fanning	SD-3									
	Sandy		985	985	328					328	
	Limestone Hills		355			355	31			31	
	Loamy		3,840	1,806	452	1,404	129	630	157	738	
	Gyp Breaks/Hills		320					320	35	35	
	Gyp Uplands		2,537			2,172	236	365	52	288	
	Gravelly		360			360	37			37	
	Total		8,397	2,791	780	4,291	433	1,315	244	1,457	1,009
7018	Clayton	SD-3									
	Deep Sand		141			141	8			8	
	Sandy		2,922	2,366	789	418	23	138	46	858	
	Bottomland		164			72	4	92	46	50	
	Limestone Hills		80			80	4			4	
	Loamy		622	392	98	134	7	96	24	129	
	Gyp Uplands		510			458	26	52	7	33	
	Gravelly		188			188	11			11	
	Total		4,627	2,758	887	1,491	83	378	123	1,093	258
7020	Spears, J.	SD-3									
	Deep Sand		1,932			1,932	126			126	
	Sandy		5,386	5,318	1,773			68	23	1,796	
	Salty Bottomland		70	70	23					23	
	Bottomland		1,036	1,036	518					518	
	Loamy		4,681	1,483	371			3,198	799	1,170	
	Gyp Uplands		4,303			2,069	135	2,234	319	454	
	Sand Hills		144			144	9			9	
	Gravelly		70			70	5			5	
	Total		17,622	7,907	2,685	4,215	275	5,500	1,141	4,101	1,145

TABLE D-1
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
MECHANICAL ONLY

				Potential Production							
				Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]		Total	Total
Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Acres	AUMs	Acres	AUMs	Acres	AUMs	Potential AUMs	Existing AUMs[e]
7021	Campbell	SD-3									
	Deep Sand		4,789			4,789	646			646	
	Sandy		2,634	2,634	878					878	
	Bottomland		100	100	50					50	
	Loamy		1,070	1,030	257	40	8			265	
	Sand Hills		819			819	108			108	
	Gravelly		40			40	8			8	
	Active Duneland[f]		775			775	0			0	
	Rocky Land[f]		50			50	0			0	
	Limey		108			108	16			16	
	Total		10,385	3,764	1,185	6,621	786			1,971	1,232
7022	Key	SD-3									
	Deep Sand		17,021			17,021	1,584			1,584	
	Sandy		8,402	8,312	2,771	90	8			2,779	
	Salty Bottomland		50			50	5			5	
	Bottomland		616	616	308					308	
	Loamy		8,324	4,122	1,030	1,820	169	2,382	596	1,795	
	Gyp Uplands		2,501			913	85	1,588	227	312	
	Sand Hills		6,616			6,616	616			616	
	Gravelly		840			840	78			78	
	Hills & Breaks		1,020			1,020	95			95	
	Active Duneland[f]		30			30	0			0	
	Rocky Land[f]		530			530	0			0	
	Waste[f]		200			200	0			0	
	Total		46,150	13,050	4,109	29,130	2,640	3,970	823	7,572	4,057
7025	West	SD-3									
	Deep Sand		1,524			1,524	127			127	
	Sandy		2,434	2,389	796	45	4			800	
	Loamy		350	350	87					87	
	Gyp Uplands		528			528	45			45	
	Sand Hills		126			126	11			11	
	Gravelly		300			300	25			25	
	Total		5,262	2,739	883	2,523	212			1,095	443
7026	Pue	SD-3									
	Deep Sand		414			414	28			28	
	Sandy		333	333	111					111	
	Bottomland		112	112	56					56	
	Loamy		612	612	153					153	
	Gyp Breaks/Hills		60			60	5			5	
	Gyp Uplands		408			408	27			27	
	Sand Hills		396			396	26			26	
	Gravelly		410			410	27			27	
	Total		2,745	1,057	320	1,688	113			433	183
7027	Smith, K.	SD-3									
	Deep Sand		28,148			28,148	2,482			2,482	
	Sandy		5,406	5,396	1,799	10	1			1,800	
	Salty Bottomland		90	90	30					30	
	Bottomland		1,028	1,028	514					514	
	Loamy		1,550	1,530	383	20	2			385	
	Gyp Breaks/Hills		380			380	33			33	
	Gyp Uplands		572			572	67			67	
	Sand Hills		8,289			8,289	733			733	
	Gravelly		174			174	15			15	
	Hills & Breaks		110			110	0			0	
	Rocky Land[f]		830			830	0			0	
	Waste[f]		1,120			1,120	0			0	
	Total		47,697	8,044	2,726	39,653	3,333			6,059	4,009
7028	Clark	SD-3									
	Deep Sand		1,158			1,158	130			130	
	Sandy		504	504	168					168	
	Bottomland		224	224	112					112	
	Loamy		828	576	144	252	29			173	
	Gyp Breaks/Hills		230			230	29			29	
	Gyp Uplands		552			552	65			65	
	Sand Hills		882			882	101			101	
	Gravelly		3,275			3,275	368			368	
	Total		7,653	1,304	424	6,349	722			1,146	870
7031	Grandi	SD-3									
	Deep Sand		5,782			5,732	370	50	20	390	
	Sandy		7,037	6,839	2,280	198	15			2,295	
	Salty Bottomland		640	90	30			550	183	213	
	Bottomland		3,380	3,348	1,674	32	2			1,676	
	Loamy		700	616	154			84	21	175	
	Gyp Breaks/Hills		50			50	3			3	

TABLE D-1
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
MECHANICAL ONLY

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production						Total Potential AUMs	Total Existing AUMs[e]
				Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]			
				Acres	AUMs	Acres	AUMs	Acres	AUMs		
7031	Grandi (Continued)										
	Gyp Uplands		354			298	23	56	8	31	
	Sand Hills		1,368			1,368	93			93	
	Gravelly		4,144			4,144	269			269	
	Hills & Breaks		100			100	0			0	
	Rocky Land[f]		130			130	0			0	
	Waste[f]		344			344	0			0	
	Total		24,029	10,893	4,138	12,396	775	740	232	5,145	1,502
7033	Mobley	SD-3									
	Deep Sand		4,415			4,415	408			408	
	Sandy		1,648	1,588	530	60	8			538	
	Salty Bottomland		1,070	1,040	347	30	3			350	
	Bottomland		824	784	392	40	3			395	
	Loamy		900	700	175	200	16			191	
	Gyp Uplands		120			120	8			8	
	Sand Hills		3,095			3,095	286			286	
	Gravelly		648			648	64			64	
	Hills & Breaks		120			120	0			0	
	Total		12,840	4,112	1,444	8,728	796			2,240	1,171
7034	Greenwood	SD-3									
	Deep Sand		1,367			1,307	134	60	20	154	
	Sandy		990	930	310	60	5			315	
	Salty Bottomland		1,657	950	316	147	15	560	187	518	
	Bottomland		586	546	273	40	5			278	
	Loamy		642	596	149	46	5			154	
	Gyp Uplands		474			474	50			50	
	Sand Hills		180			180	18			18	
	Gravelly		168			168	18			18	
	Total		6,064	3,022	1,048	2,422	250	620	207	1,505	416
7035	J. & M. Farms	SD-3									
	Deep Sand		790			790	78			78	
	Sandy		1,407	1,407	469					469	
	Salty Bottomland		20	20	7		1			8	
	Bottomland		860	860	430					430	
	Loamy		550	550	137					137	
	Gyp Uplands		6			6	1			1	
	Gravelly		1,090			1,090	106			106	
	Rocky Land[f]		110			110	0			0	
	Total		4,833	2,837	1,043	1,996	186			1,229	450
7037) 7038)	Delaware	SD-3									
	Deep Sand		6,185			6,185	618			618	
	Sandy		6,329	6,329	2,109					2,109	
	Bottomlands		92	92	46					46	
	Loamy		644	644	161					161	
	Gravelly		5,730			5,730	571			571	
	Hills & Breaks		230			230	0			0	
	Total		19,210	7,065	2,316	12,145	1,189			3,505	1,880
7039	Lindsay	SD-3									
	Deep Sand		9,003			9,003	1,074			1,074	
	Sandy		3,444	3,444	1,148					1,148	
	Bottomland		52	52	26					26	
	Loamy		175	63	43	112	16			59	
	Sand Hills		66			66	16			16	
	Gravelly		3,819			3,819	452			452	
	Hills & Breaks		490			490	0			0	
	Total		17,049	3,559	1,217	13,490	1,558			2,775	1,970
7041	Johnson, W.	SD-3									
	Deep Sand		3,404			3,404	240			240	
	Sandy		982	982	327					327	
	Bottomland		34	34	17					17	
	Loamy		492	492	123					123	
	Gyp Uplands		1,662			1,662	118			118	
	Gravelly		500			500	35			35	
	Hills & Breaks		220			220	0			0	
	Total		7,294	1,508	467	5,786	393			860	496
Subtotal			930,356	139,607	46,444	717,689	77,477	73,060	17,136	141,057	102,170

TABLE D-1
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
MECHANICAL ONLY

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production: Brush Treatment[b] Acres	Brush Treatment[b] AUMs	No Brush Treatment[c] Acres	No Brush Treatment[c] AUMs	Grassland[d] Acres	Grassland[d] AUMs	Total Potential AUMs	Total Existing AUMs[e]
No Specific Grazing Systems											
5001	Sea Cattle	CP-2									
	Deep Sand		66			66	7			7	
	Sandy		825			825	147			147	
	Bottomland		330			330	62			62	
	Loamy		429			429	73			73	
	Gyp Breaks/Hills		196			196	13			13	
	Gyp Uplands		100			100	6			6	
	Gravelly		495			495	61			61	
	Loamy Sand		100			100	20			20	
	Hills & Breaks		462			462	0			0	
	Shallow		297			297	0			0	
	Total		3,300			3,300	389			389	389
5002	Gainer	CP-2									
	Deep Sand		112			112	7			7	
	Sandy		238			238	22			22	
	Total		350			350	29			29	29
5003	N. Plains Land & Inv.	CP-2									
	Sandy		120			120	15			15	
	Total		120			120	15			15	15
5004	Boone	CP-2									
	Deep Sand		1,050			1,050	114			114	
	Sandy		1,450			1,450	246			246	
	Sand Hills		530			530	70			70	
	Shallow		30			30	9			9	
	Total		3,060			3,060	439			439	439
5006	Van Eaton	CP-2									
	Loamy		96			96	11			11	
	Shallow		64			64	0			0	
	Total		160			160	11			11	11
5008	Van Eaton	CP-2									
	Deep Sand		574			574	90			90	
	Sandy		739			749	177			177	
	Sand Hills		23			23	4			4	
	Gravelly		574			547	101			101	
	Hills & Breaks		375			375	0			0	
	Shallow		47			47	4			4	
	Total		2,342			2,342	376			376	376
5009	Marley	CP-2									
	Deep Sand		1,690			1,690	120			120	
	Sandy		544			544	68			68	
	Sand Hills		360			360	34			34	
	Limey		82			82	10			10	
	Shallow		84			84	10			10	
	Sand Loamy		170			170	18			18	
	Total		2,930			2,930	260			260	260
5011	Moorhead	CP-2									
	Deep Sand		423			423	40			40	
	Sandy		738			738	97			97	
	Sand Hills		547			547	62			62	
	Shallow		174			174	10			10	
	Total		1,882			1,882	209			209	209
5013	Goods, Inc.	CP-2									
	Deep Sand		1,780			1,780	167			167	
	Sand Hills		281			281	32			32	
	Total		2,061			2,061	199			199	199
5014	McDowell (East)	CP-2									
	Deep Sand		36			36	3			3	
	Sandy		88			88	13			13	
	Shallow		36			36	2			2	
	Total		160			160	18			18	18
5015	Southard, F.	CP-2									
	Deep Sand		80			80	6			6	
	Sand Hills		80			80	7			7	
	Total		160			160	13			13	13
5016	Southard, T.	CP-2									
	Deep Sand		709			709	65			65	
	Sand Hills		661			661	73			73	
	Total		1,370			1,370	138			138	138
5017	Southard, J.	CP-2									
	Deep Sand		125			125	12			12	
	Sand Hills		195			195	25			25	
	Total		320			320	37			37	37

TABLE D-1
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
MECHANICAL ONLY

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production: Brush Treatment[b] Acres	Potential Production: Brush Treatment[b] AUMs	Potential Production: No Brush Treatment[c] Acres	Potential Production: No Brush Treatment[c] AUMs	Potential Production: Grassland[d] Acres	Potential Production: Grassland[d] AUMs	Total Potential AUMs	Total Existing AUMs[e]
5022	Smith, H.	CP-2									
	Gravelly		240			240	79			79	
	Hills & Breaks		160			160	0			0	
	Total		400			400	79			79	79
5023	White	SD-3									
	Gyp Uplands		191			191	11			11	
	Loamy Sand[f]		191			191	55			55	
	Riparian		134			134	0			0	
	Deep Sand	CP-2	310			310	55			55	
	Sandy		207			207	56			56	
	Total		1,033			1,033	177			177	177
5026	Faircloth	CP-2									
	Deep Sand		73			73	13			13	
	Sandy		578			578	154			154	
	Loamy		128			128	37			37	
	Gravelly		46			46	9			9	
	Hills & Breaks		37			37	0			0	
	Shallow		37			37	0			0	
	Gyp Uplands	SD-3	18			18	2			2	
	Total		917			917	215			215	215
5027	Nuckols	CP-2									
	Deep Sand		484			484	38			38	
	Sandy		40			40	5			5	
	Sand Hills		213			213	20			20	
	Total		737			737	63			63	63
5030	Jenkins	CP-2									
	Deep Sand		199			199	26			26	
	Sand Hills		91			91	15			15	
	Sandy	HP-3	30			30	5			5	
	Total		320			320	46			46	46
5031	Huston	HP-3									
	Deep Sand		259			259	42			42	
	Sandy		480			480	126			126	
	Sand Hills		212			212	42			42	
	Total		951			951	210			210	210
5033	Cato	CP-2									
	Deep Sand		328			328	39			39	
	Sandy		139			139	25			25	
	Sand Hills		182			182	27			27	
	Limey		11			11	0			0	
	Shallow		30			30	0			0	
	Total		690			690	91			91	91
5035	Whitelake	CP-2									
	Deep Sand		734			734	62			62	
	Sandy		220			220	29			29	
	Total		954			954	91			91	91
5039	Red Tank	CP-2									
	Deep Sand		28			28	2			2	
	Sand Hills		52			52	7			7	
	Total		80			80	9			9	9
5039	Sherman Cattle	CP-2									
	Deep Sand		166			166	17			17	
	Sand Hills		234			234	29			29	
	Total		400			400	46			46	46
5042	Glenn	CP-2									
	Deep Sand		305			305	27			27	
	Sandy		111			111	16			16	
	Loamy		18			18	2			2	
	Sand Hills		117			117	13			13	
	Limey		77			77	10			10	
	Shallow		12			12	0			0	
	Total		640			640	68			68	68
5045	Caprock Ranch	CP-2									
	Deep Sand		404			404	36			36	
	Sand Hills		1,036			1,036	110			110	
	Total		1,440			1,440	146			146	146
5050	Clemmons & Erdmann	CP-2									
	Deep Sand		274			274	30			30	
	Sand Hills		306			306	44			44	
	Deep Sand	HP-3	670			670	75			75	
	Sandy		370			370	66			66	
	Gravelly		66			66	7			7	
	Loamy Sand		44			44	7			7	
	Total		1,730			1,730	229			229	229

TABLE D-1
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
MECHANICAL ONLY

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production: Brush Treatment[b]		No Brush Treatment[c]		Grassland[d]		Total Potential AUMs	Total Existing AUMs[e]
				Acres	AUMs	Acres	AUMs	Acres	AUMs		
5052	Marley	CP-2									
	Deep Sand		26			26	6			6	
	Sand Hills		14			14	3			3	
	Total		40			40	9			9	9
5054	Irvin	SD-3									
	Gyp Uplands		79			79	8			8	
	Gravelly		30			30	8			8	
	Loamy Sand		281			281	117			117	
	Total		390			390	133			133	133
5056	Graham, L.	SD-3									
	Deep Sand		44			44	9			9	
	Sandy		65			65	18			18	
	Gyp Uplands		54			54	4			4	
	Gravelly		40			40	9			9	
	Loamy Sand		151			151	47			47	
	Total		354			354	87			87	87
5059	Wilson	SD-3									
	Gyp Breaks/Hills		210			210	10			10	
	Gyp Uplands		418			418	24			24	
	Loamy Sand		404			404	84			84	
	Total		1,032			1,032	118			118	118
5060	Sallee	SD-3									
	Gyp Uplands		136			136	10			10	
	Loamy Sand		90			90	25			25	
	Total		226			226	35			35	35
5061	Woods	SD-3									
	Gyp Uplands		78			78	7			7	
	Gravelly		68			68	16			16	
	Loamy Sand		194			194	60			60	
	Total		340			340	83			83	83
5064	Lee	HP-3									
	Sandy		96			96	14			14	
	Loamy		58			58	8			8	
	Gravelly		302			302	35			35	
	Loamy Sand		132			132	17			17	
	Very Shallow		72			72	9			9	
	Shallow		220			220	26			26	
	Total		880			880	109			109	109
5070	Miles	SD-3									
	Bottomland		10			10	2			2	
	Gyp Breaks/Hills		235			235	16			16	
	Gravelly		72			72	18			18	
	Loamy Sand		113			113	18			18	
	Total		430			430	54			54	54
5071	Glass	SD-3									
	Loamy		25			25	9			9	
	Gyp Breaks/Hills		55			55	2			2	
	Total		80			80	11			11	11
5081	Greer	SD-3									
	Sandy		59			59	14			14	
	Gravelly		444			444	82			82	
	Loamy Sand		30			30	5			5	
	Hills & Breaks		158			158	0			0	
	Shallow Sand		59			59	14			14	
	Shallow		237			237	0			0	
	Total		987			987	115			115	115
5089	Medlin, B.	HP-3									
	Loamy		220			220	35			35	
	Very Shallow		180			180	25			25	
	Total		400			400	60			60	60
5093	Haley	SD-3									
	Gravelly		35			35	1			1	
	Loamy Sand		56			56	2			2	
	Shallow Sand		5			5	1			1	
	Total		96			96	4			4	4
6001	McCrory	SD-3									
	Loamy Sand		40			40	10			10	
	Total		40			40	10			10	10
6002	Field	SD-3									
	Shallow		29			29	7			7	
	Total		29			29	7			7	7

TABLE D-1
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
MECHANICAL ONLY

				Potential Production							
Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Brush Treatment[b] Acres	AUMs	No Brush Treatment[c] Acres	AUMs	Grassland[d] Acres	AUMs	Total Potential AUMs	Total Existing AUMs[e]
6003	Taylor & Heidel	SD-3									
	Loamy Sand		11			11	3			3	
	Shallow		29			29	3			3	
	Total		40			40	6			6	6
6010	Snyder, Ltd.	SD-3									
	Sandy		120			120	13			13	
	Gravelly		381			381	36			36	
	Loamy Sand		19			19	2			2	
	Total		520			520	51			51	51
6012	Sims	SD-3									
	Deep Sand		10			10	1			1	
	Sand Hills		15			15	1			1	
	Active Duneland [f]		15			15	0			0	
	Total		40			40	2			2	2
6013	Klein	HP-3									
	Deep Sand		138			138	35			35	
	Active Duneland [f]		138			138	0			0	
	Deep Sand	SD-3	22			22	5			5	
	Active Duneland [f]		22			22	0			0	
	Total		320			320	40			40	40
6014	S & W Cattle	HP-3									
	Deep Sand		599			599	36			36	
	Sandy		20			20	2			2	
	Sand Hills		436			436	34			34	
	Gravelly		88			88	6			6	
	Loamy Sand		42			42	3			3	
	Active Duneland [f]		585			585	0			0	
	Limey		30			30	2			2	
	Total		1,800			1,800	83			83	83
6015	Kornegay	HP-3									
	Deep Sand		350			350	21			21	
	Sand Hills		638			638	48			48	
	Gravelly		40			40	3			3	
	Active Duneland [f]		572			572	0			0	
	Total		1,600			1,600	72			72	72
6016	Terry	HP-3									
	Deep Sand		150			150	19			19	
	Sandy		20			20	4			4	
	Sand Hills		313			313	51			51	
	Gravelly		10			10	2			2	
	Active Duneland [f]		314			314	0			0	
	Total		807			807	76			76	76
6017	Hill	HP-3									
	Deep Sand		180			180	12			12	
	Sand Hills		330			330	27			27	
	Active Duneland [f]		330			330	0			0	
	Total		840			840	39			39	39
6018	Turland	HP-3									
	Deep Sand		660			660	28			28	
	Sandy		20			20	1			1	
	Sand Hills		480			480	25			25	
	Deep Sand	SD-3	48			48	2			2	
	Sandy		0			0	0			0	
	Sand Hills		32			32	1			1	
	Total		1,240			1,240	57			57	57
6019	Cooper, D.	SD-3									
	Deep Sand		310			310	32			32	
	Sand Hills		385			385	35			35	
	Active Duneland [f]		265			265	0			0	
	Total		960			960	67			67	67
6024	Wallach	HP-3									
	Sandy		10			10	1			1	
	Gravelly		72			72	6			6	
	Loamy Sand		28			28	3			3	
	Waste [f]		10			10	0			0	
	Total		120			120	10			10	10
6025	Robinson	SD-3									
	Deep Sand		1,604			1,604	197			197	
	Sandy		208			208	36			36	
	Sand Hills		16			16	1			1	
	Gravelly		40			40	5			5	
	Total		1,868			1,868	239			239	239

TABLE D-1
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
MECHANICAL ONLY

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production: Brush Treatment[b] Acres	Brush Treatment[b] AUMs	No Brush Treatment[c] Acres	No Brush Treatment[c] AUMs	Grassland[d] Acres	Grassland[d] AUMs	Total Potential AUMs	Total Existing AUMs[e]
6026	Robinson	SD-3									
	Deep Sand		410			410	63			63	
	Sand Hills		436			436	64			64	
	Active Duneland[f]		276			276	0			0	
	Total		1,122			1,122	127			127	127
6028	Brininstool, Wm.	SD-3									
	Deep Sand		730			730	47			47	
	Sandy		500			500	32			32	
	Hills & Breaks		50			50	0			0	
	Total		1,280			1,280	79			79	79
6029	Ward	SD-3									
	Gravelly		120			120	4			4	
	Total		120			120	4			4	4
6031	Goins	HP-3									
	Deep Sand		40			40	7			7	
	Sand Hills		80			80	18			18	
	Active Duneland[f]		80			80	0			0	
	Deep Sand	SD-3	170			170	32			32	
	Sand Hills		95			95	16			16	
	Active Duneland[f]		95			95	0			0	
	Total		560			560	73			73	73
6032	Winters	SD-3									
	Deep Sand		150			150	9			9	
	Sandy		170			170	16			16	
	Gravelly		70			70	5			5	
	Loamy Sand		170			170	20			20	
	Hills & Breaks		80			80	0			0	
	Total		640			640	50			50	50
6034	Wylie	SD-3									
	Deep Sand		930			930	119			119	
	Sandy		607			607	76			76	
	Sand Hills		95			95	12			12	
	Gravelly		243			243	29			29	
	Loamy Sand		70			70	10			10	
	Hills & Breaks		10			10	0			0	
	Active Duneland[f]		175			175	0			0	
	Total		2,130			2,130	246			246	246
6035	Madera, R.F., et al.	SD-3									
	Deep Sand		1,010			1,010	191			191	
	Sandy		1,551			1,551	294			294	
	Gravelly		610			610	113			113	
	Active Duneland[f]		30			30	0			0	
	Total		3,201			3,201	598			598	598
6036	Madera	SD-3									
	Deep Sand		45			45	2			2	
	Sandy		35			35	2			2	
	Total		80			80	4			4	4
6041	Dinwiddie	SD-3									
	Deep Sand		210			210	35			35	
	Sandy		110			110	23			23	
	Loamy Sand		110			110	26			26	
	Active Duneland[f]		160			160	0			0	
	Total		590			590	84			84	84
6047	Deck	SD-3									
	Deep Sand		2,083			2,083	234			234	
	Sandy		390			390	60			60	
	Sand Hills		49			49	5			5	
	Gravelly		20			20	2			2	
	Active Duneland[f]		70			70	0			0	
	Total		2,612			2,612	301			301	301
6048	Maddox	SD-3									
	Deep Sand		2,391			2,391	300			300	
	Sandy		1,965			1,965	333			333	
	Sand Hills		406			406	49			49	
	Gravelly		719			719	105			105	
	Loamy Sand		30			30	8			8	
	Active Duneland[f]		230			230	0			0	
	Limey		90			90	16			16	
	Total		5,831			5,831	811			811	811
6049	Snyder, Ltd. (Hart)	SD-3									
	Deep Sand		1,378			1,378	223			223	
	Sandy		7			7	1			1	
	Sand Hills		732			732	108			108	
	Gravelly		323			323	59			59	
	Active Duneland[f]		1,080			1,080	0			0	
	Total		3,520			3,520	391			391	391

TABLE D-1
PRESENT AND POTENTIAL FORAGE PRODUCTION ON ALLOTMENTS BY RANGE SITE
MECHANICAL ONLY

Allot. No.	Allotment Name and Range Sites	MLRA[a]	Total Acres	Potential Production: Brush Treatment[b] Acres	Brush Treatment[b] AUMs	No Brush Treatment[c] Acres	No Brush Treatment[c] AUMs	Grassland[d] Acres	Grassland[d] AUMs	Total Potential AUMs	Total Existing AUMs[e]
6050	Hilburn	SD-3									
	Loamy Sand		19			19	7			7	
	Shallow		21			21	3			3	
	Total		40			40	10			10	10
7001	Haven	SD-3									
	Deep Sand		88			88	3			3	
	Sandy		62			62	3			3	
	Salty Bottomland		100			100	4			4	
	Loamy		603			603	34			34	
	Gyp Uplands		522			522	6			6	
	Total		1,375			1,375	50			50	50
7002	Karr	SD-3									
	Deep Sand		30			30	2			2	
	Salty Bottomland		40			40	3			3	
	Loamy		246			246	23			23	
	Gyp Uplands		352			352	7			7	
	Total		668			668	35			35	35
7009	Evans	SD-3									
	Bottomland		199			199	12			12	
	Loamy		53			53	3			3	
	Gravelly		597			597	22			22	
	Hills & Breaks		52			52	0			0	
	Total		901			901	37			37	37
7010	Solt	SD-3									
	Deep Sand		174			174	10			10	
	Sandy		1,176			1,176	98			98	
	Bottomland		287			287	30			30	
	Gravelly		263			263	21			21	
	Total		1,900			1,900	159			159	159
7017	Greenwood, H.	SD-3									
	Sandy		375			375	12			12	
	Bottomland		250			250	10			10	
	Loamy		405			405	14			14	
	Total		1,030			1,030	36			36	36
7023	Beker Ind.	SD-3									
	Sandy		563			563	44			44	
	Salty Bottomland		158			158	10			10	
	Loamy		406			406	26			26	
	Total		1,127			1,127	80			80	80
7024	Simpson	SC-3									
	Deep Sand		273			273	16			16	
	Sandy		1,172			1,172	96			96	
	Bottomland		44			44	4			4	
	Sand Hills		36			36	1			1	
	Gravelly		270			270	21			21	
	Total		1,795			1,795	138			138	138
7029	Bond	SD-3									
	Sandy		712			712	76			76	
	Bottomland		40			40	6			6	
	Loamy		150			150	20			20	
	Gyp Uplands		413			413	16			16	
	Gravelly		380			380	40			40	
	Total		1,695			1,695	158			158	158
7030	Tracy	SC-3									
	Sandy		20			20	0			0	
	Gravelly		599			599	33			33	
	Total		619			619	33			33	33
Subtotal			76,822			76,822	8,684			8,684	8,684
GRAND TOTAL			1,590,134	263,056	88,031	1,240,241	136,042	86,837	19,966	244,039	175,167

[a] Range sites are listed by SCS major land resource areas (MLRA): SD3 = Southern Desert, CP2 = Pecos Canadian Plains and Valleys, HP3 = Southern High Plains.

[b] Brush removal and proper management; forage production would approximate SCS projection for that range site in excellent condition by year 2000.

[c] No control of infesting brush; forage production would approximate SCS projection for that range site in poor condition by year 2000.

[d] Grasslands with proper management should recover to SCS projection for that range site in excellent condition by year 2000.

[e] Data is from 1977 Range Survey.

APPENDIX
V

APP V

STATE OF NEW MEXICO
EDUCATIONAL FINANCE AND CULTURAL AFFAIRS DEPARTMENT
HISTORIC PRESERVATION PROGRAM
SANTA FE
87503

P.O. BOX 1629

AREA CODE 505
TELEPHONE 827-2108

November 29, 1978

Mr. James H. O'Connor
District Manager
Bureau of Land Management
P.O. Box 1397
Roswell, New Mexico 88201

Attn: Ann Ramage

Dear Mr. O'Connor:

This is to establish a record of the determination of eligibility to the National Register of Historic Places of certain prehistoric and historic sites in the area to be covered by the East Roswell Grazing Environmental Statement. This determination was made among Ms. Ann Ramage of your staff, Mr. Daniel E. Reiley of my staff, and me at my office on November 21, 1978. The determination was carried out in accordance with 36 CFR 800.

The following sites were found to meet criterion (d) of eligibility, and were found to constitute a community of related sites at or near the Maroon Cliffs: ENM 10258, 10036, 10045, 10261, 10262, 10265, 10269, 10260, 10044, 10270, 10271, 10263, 10268, 10267, 10266, 10264, 10259, 10276, 10277, 10310, 10313, 10314; AR 30-6-640, 30-6-639, 30-6-642, 30-6-643, 30-6-771, 30-6-98, 30-6-96, 30-6-99, 30-6-189, 30-6-638, 30-6-659, 30-6-660; ENM 10285, 10288, 10273, 10252, 10253, 10254, 10280, 10281, 10274, 10279, 10275, 10272, 10256, 10255; AR 30-6-674, 30-6-663, 30-6-665, 30-6-658, 30-6-664, 30-6-251; ENM 10292, 10289, 10290 (these three sites may in fact be one site), 10291, 10293, 10294, 10307, 10309, 10301, 10302, 10303, 10298, 10297, 10308, 10299, 10296, 10304, 10305, 10306, 10295, 10282, 10283, 10300.

ENM 10286, a historic trash area, was found to be ineligible. We noted that the northern slope of the Maroon Cliffs had not been surveyed, and that this area would have to be investigated before any archeological district could be established.

We next reviewed a group of forms having to do with sites in the Mescalero Sands vicinity. One site (MS-C-9) was agreed to have special scientific value and therefore was considered eligible; the others were found ineligible. This was a managerial decision, based on the belief that the Mescalero Sands Archeological District, as presently defined and nominated to the National Register of Historic Places, is likely to yield significant scientific information which would only be duplicated by investigation of these sites, which are: MS-C-8, MS-C-6,

MS-C-7A, MS-C-7B, MS-C-10, MS-C-1, MS-C-2, MS-C-3, MS-C-4, MS-C-5, MS-C-14, MS-C-12, MS-C-11, MS-C-13, MS-C-15, MS-C-16, MS-B-24, MS-B-39, MS-B-40, MS-B-41, MS-B-25, MS-A-1, MS-B-27, MS-B-7, MS-B-6, MS-B-28, MS-B-26, MS-B-28, AR 30-6-192.

We next reviewed a group of sites in Pierce Canyon; these were: AR 30-6-968, 30-6-967, 30-6-1120, 30-6-1117, 30-6-1122, 30-6-1119, 30-6-1123, 30-6-1118, 30-6-1121. These are in fact two groups of sites which give evidence of being related, but are separated by a two-mile unsurveyed area. In view of this circumstance, we agreed that the significance of these sites could not be determined.

We then reviewed forms for three sites identified by Jelinek in his survey of the middle Pecos. These were: AR 30-6-401, 30-6-400, 30-6-423. We agreed that not enough information existed to make a determination of the eligibility of these sites possible.

The following sites were found not to meet any criterion of eligibility to the National Register: ENM 10284, AR 30-6-831, ENM 10089, ENM 10087, AR 30-6-595, 30-6-277, 30-6-278, 30-6-281, 30-6-280, 30-6-279, 30-6-603, ENM 10105, ENM 10003, AR 30-6-1128, 30-6-1129, 30-6-811, 30-6-1132, 30-6-596, ENM 10315, 10312, 10311, AR 30-6-600, ENM 10096, 10495, (AR 30-6-612), AR 30-6-1146, AR 6-1100, AR 6-1073, ENM 10095, AR 78-310, AR 30-6-960, AR 30-6-822, 30-6-598, 30-6-587, 30-6-387, 30-6-630, 30-6-1107, 30-6-602, ENM 10326, AR 30-6-824, 30-6-985, 30-6-809, 30-6-810, 30-6-964, 30-6-812, 30-6-805, 30-6-804, 30-6-886, 30-6-914, 30-6-962, 30-6-1109, 30-6-690, 30-6-671, 30-6-688, 30-6-398, ENM 10278, ENM 10051, AR 30-6-940, ENM 10093, ENM 12092, ENM 10115, AR 6-1104, AR 6-1103, AR 30-6-611, AR 30-6-458, 30-6-1144, 30-6-1195, 30-6-1143, 30-6-1191, 30-6-942, 30-6-797, 30-6-834, 30-6-802, ENM 10116, AR 30-6-792, 30-6-689, 30-6-606, 30-6-820, 30-6-634, 30-6-992, 30-6-990, 30-6-1105, 30-6-308, 30-6-593, 30-6-1127, 6-78-1101, 6-78-230, 6-30-1036, 30-6-799, 30-6-613, 6-30-803, 30-6-615, 30-6-601, 30-6-620, 30-6-941, 30-6-943, 30-6-1111, 30-6-908.

HI-190 (the original potash bullwheel) was found to be eligible to the National Register of Historic Places as a historic engineering site embodying distinctive characteristics and representing a particular type and method of construction.

HI-30-6-103 (the "Rustler Corrals") was found to merit further investigation, but no determination was made.

Numerous sites recorded by amateurs were also reviewed. We believed that these sites, or some of them, might possess qualities of significance, but we were not prepared to rely without question on the information presented, and so made no determination. These sites are:

AR-30-6-41
AR-30-6-1028
AR-30-6-179
AR-30-6-98
AR-30-6-135
AR-30-6-140
AR-30-6-141
AR-30-6-240
AR-30-6-1068
A-30-6-119
AR-30-6-1061
AR-30-6-204
AR-30-6-198
AR-30-6-37
AR-30-6-209
AR-30-6-24
AR-30-6-200
AR-30-6-256

AR-30-6-257
AR-30-60-88 (LCAS C18)
AR-30-60-184
AR-30-6-87
AR-30-6-94
AR-30-6-1035
AR-30-6-122
AR-30-6-890
AR-30-6-1002

AR-30-6-691
AR-30-6-895
AR-30-6-38
AR-30-6-201
AR-30-6-223
AR-30-6-92
AR-30-6-90
AR-30-6-74
AR-30-6-1064
AR-30-6-1007
AR-30-6-75
AR-30-6-138
AR-30-60-187
AR-30-60-175
AR-30-6-202
AR-30-6-1066
AR-30-6-1070
AR-30-6-1062

AR-30-6-1003
AR-30-6-136
AR-30-6-214
AR-30-6-1065
AR-30-6-1071
AR-30-6-1072
AR-30-6-210
AR-30-6-897
AR-30-6-892
AR-30-6-255
AR-30-6-253

HI 30-6-131 (town of Florence) was considered worthy of further investigation, but no determination was made.

AR 30-6-30, 30-6-73 and 30-6-1034 were found to meet criterion (d) of eligibility. No determination was made with respect to AR-30-6-32, 6-27, 30-6-76, 30-6-33, 30-6-1016, 30-6-721, 30-6-724.

No determination was made, in view of the sketchy information available, with respect to sites AR-30-6-896 (etc.).

AR-30-6-896
AR-30-60-123
AR-30-6-118 (LCAS C45)
AR-30-6-245
AR-30-6-139
AR-30-6-222
AR-30-6-1005
AR-30-6-4
AR-30-6-1027
AR-30-6-770
AR-30-6-243
AR-30-6-203

AR-30-6-254
AR-30-6-219
AR-30-6-1063
AR-30-6-32
AR-30-6-891
AR-30-6-1060

AR-30-6-775
AR-30-6-787
AR-30-6-786
AR-30-6-780
AR-30-6-781
AR-30-6-772
AR-30-6-773
AR-30-6-789
AR-30-6-68
AR-30-6-47
AR-30-6-26
AR-30-6-54
AR-30-6-1
AR-30-6-6
AR-30-6-166

AR-30-6-56
AR-30-6-61
AR-30-6-70
AR-30-6-69
AR-30-6-67
AR-30-6-45
AR-30-6-227
AR-30-6-225

AR-30-6-258
AR-30-6-97
AR-30-6-260
AR-30-6-259
AR-30-6-42
AR-30-6-718
AR-30-6-100
AR-30-6-101

Three sites could be identified only by field form numbers (69, 70, 60). No determination was made regarding these.

In those cases in which no determination was arrived at, I believe it would be proper to avoid disturbing the site in question until better information can be assembled. A determination of eligibility may then be made on the basis of that information.

This letter should not be considered a statement covering all significant sites in the proposed grazing lease, nor is it a consideration of possible effects. I would appreciate having a map of the lease, indicating the locations of the various concentrations of sites, since as matters stand, I have no way of knowing if the sites we have reviewed are fully representative of the range of sites on the lease.

These determinations are subject to review by the Keeper of the National Register, according to the terms of 36 CFR 63.3.

Please let me know if the above differs in any way from the meeting notes taken by your staff.

Sincerely,

Thomas W. Merlan

Thomas W. Merlan
State Historic
Preservation Officer

TWM:dg

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
District Office
P.O. Box 1397
Roswell, New Mexico 88201

IN REPLY REFER TO
1792
x6420

January 25, 1979

Keeper
National Register
National Park Service
Washington, D.C. 20240

Dear Sir:

The Bureau of Land Management, Roswell District Office, is in the process of writing an Environmental Statement (ES) on the effects of grazing. In accordance with the requirements of 36 CFR 800 the SHPO was consulted regarding the eligibility of the sites within the ES area to the National Register of Historic Places. Enclosed is a copy of the SHPO comments and a copy of the site forms.

Sincerely yours,

s/G. BARTLETT

Acting District Manager

Enclosure

United States Department of the Interior

HERITAGE CONSERVATION AND RECREATION SERVICE
WASHINGTON, D.C. 20240

IN REPLY REFER TO: 661

Ms. Grace W. Bartlett
Acting District Manager
U.S. Department of the Interior
Bureau of Land Management
District Office
P.O. Box 1397
Roswell, New Mexico 88201

Dear Ms. Bartlett:

Thank you for your letter requesting a determination of eligibility for inclusion in the National Register pursuant to Executive Order 11593 or the National Historic Preservation Act of 1966, as amended. Our determination appears on the enclosed material.

As you understand, your request for our professional judgment constitutes a part of the Federal planning process. We urge that this information be integrated into the National Environmental Policy Act analysis in order to bring about the best possible program decisions. This determination does not serve in any manner as a veto to uses of property, with or without Federal participation or assistance. Any decision on the property in question and the responsibility for program planning concerning such properties lie with the agency or block grant recipient after the Advisory Council on Historic Preservation has had an opportunity to comment.

We are pleased to be of assistance in the consideration of historic resources in the planning process.

Sincerely yours,

Charles A Herrington

Charles A. Herrington
Acting Keeper of the National Register

Enclosure

STATE OF NEW MEXICO

DEPARTMENT OF
FINANCE AND ADMINISTRATION
PLANNING DIVISION

BRUCE KING
GOVERNOR

DAVID W. KING
SECRETARY

ANITA HISENBERG
DIRECTOR

505 DON GASPAR AVENUE
SANTA FE, NEW MEXICO 87503
(505) 827-2073
(505) 827-5191
827-2108

August 6, 1979

Mr. James H. O'Connor, District Manager
Bureau of Land Management
P. O. Box 1397
Roswell, New Mexico 88201

Dear Mr. O'Connor:

Thank you for your letter of July 10, 1979, about the Draft Environmental Statement for grazing management in the East Roswell area.

In my opinion, given the nature of the undertaking, the procedures outlined for consideration of cultural resources are adequate and proper. This opinion is given with the understanding that the ability to avoid any cultural resource is not foreclosed at any point in the review of the undertaking. I believe this statement is warranted.

Major direct and indirect impacts are adequately addressed.

As I pointed out in my letter of June 25, 1979, to Mr. Tom Kiddoo, the DES does not present an adequate picture of the site population. This deficiency makes a continuing 36CFR800 review of individual activities (brush control, facilities construction, etc.) necessary. I believe such continuing review is workable.

Please let me know if you need any further information.

Sincerely,

Thomas W. Merlan

Thomas W. Merlan
State Historic Preservation Officer
Historic Preservation Bureau

TWM:lm

LISTINGS

L

COMMON AND TAXONOMIC NAME OF PLANTS
(Nomenclature from Gould, F. W., 1975, Texas Plants - A Checklist and Ecological Summary)

GRASSES

Common Name	Taxonomic Name
Barnyardgrass	Echinochloa crusgallii
Bluestem, Big	Andropogon gerardii var. gerardii
Bluestem, Little	Schizachyrium scoparium
Bluestem, Sand	Andropogon gerardii var. paucipilus
Bluestem, Silver	Bothriochloa saccharoides
Bristlegrass, Plains	Setaria macrostachya
Buffalograss	Buchloe dactyloides
Burrograss	Schleropogon brevifolius
Canarygrass	Phalaris caroliniana
Cottontop, Arizona	Digitaria californica
Dropseed, Mesa	Sporobolus flexous
Dropseed, Sand	Sporobolus cryptandrus
Fluffgrass	Erioneuron pulchellum
Grama, Black	Bouteloua eriopoda
Grama, Blue	Bouteloua gracilis
Grama, Hairy	Bouteloua hirsuta
Grama, Gyp	Bouteloua breviseta
Grama, Sideoats	Bouteloua curtipendula
Grama, Sixweeks	Bouteloua barbata
Lovegrass, Plains	Eragrostis intermedia
Lovegrass, Sand	Eragrostis trichoides
Muhly, Bush	Muhlenbergia porteri
Muhly, Ring	Muhlenbergia torreyi
Needle-and-Thread	Stipa comata
New Mexico Feathergrass	Stipa neomexicana
Panicum, Halls	Panicum hallii
Sacaton, Alkali	Sporobolus airoides
Sacaton, Giant	Sporobolus giganteus
Saltgrass, Inland	Distichlis spicata var. stricta
Sandbur, Big	Cenchrus myosuroides
Spangletop, Green	Leptochloa dubia
Threeawn	Aristida sp.
Tobosa	Hilaria mutica
Tridens, Rough (Slim)	Tridens muticus
Tridens, White	Tridens albescens
Vine Mesquite	Panicum obtusum
Windmillgrass, Hooded	Chloris cucullata
Windmillgrass Tumble	Chloris verticillata

WOODY PLANTS

Common Name	Taxonomic Name
Acacia, Catclaw	Acacia greggii
Acacia, Whitethorn	Acacia constricta
Ceonothus, Desert	Ceonothus greggii
Cottonwood	Populus sp.
Creosote	Larrea tridentata
Crucifixion thorn	Koeberlina spinosa
Dalea, Feather	Dalea formosa
Elm	Ulmus americana
Hackberry, Netleaf	Celtis reticulata
Javelinabush	Microhamnus ericoides
Mesquite, Honey	Prosopis glandulosa var. glandulosa
Mormon tea	Ephedra, sp.
Ratany	Krameria sp.
Sagebrush, Fringed	Artemisia frigida
Sagebrush, Sand	Artemesia filifolia
Saltbush, Fourwing	Atriplex canescens
Saltcedar	Tamarix gallica
Shinnery Oak	Quercus havardii
Snakeweed, Broom	Gutierrezia sarothae
Soapberry	Sapindus drummondii
Sumac, Littleleaf	Rhus microphylla
Tarbush	Flourensia cernua
Walnut, Desert	Juglans microcarpa
Willow, Desert	Salix sp.
Yucca	Yucca elata

FORBS

Common Name	Taxonomic Name
Bladderpod	Lesquerella sp.
Buckwheat	Eriogonum sp.
Cocklebur	Xanthium sp.
Croton	Croton sp.
Deer Apples	Ibervillea sp.
Fillaree	Erodium sp.
Goldenrod, Rayless	Haplopappus sp.
Ground Cherry	Physalis sp.
Groundsel, Threadleaf	Senecio longilobus
Lemonweed	Pectis sp.
Locoweed	Astragalus sp.
Mallow, Globe	Sphaeralcea sp.
Nightshade	Solanum sp.
Onion, Wild	Allium sp.
Pigweed	Amaranthus sp.
Primrose	Oenothera sp.
Russian thistle	Salsola kali
Spectaclepod	Dithyraea wislizeni
Sunflower	Helianthus sp.

OTHERS

Common Name	Taxonomic Name
Cattail	Typha sp.
Millet, Wild Duck	Echinochloa sp.
Pondweed	Potamogeton
Rush	Juncus sp.
Sedge	Scirpus sp.

MAJOR HABITAT TYPES AND RELATED ANIMAL SPECIES
(Source: Step 3 URA BLM Files)

RIPARIAN HABITAT

CLASS OF ANIMAL	COMMON NAME	SEASON OF USE
Amphibians	Tiger Salamander	YL
	**Eastern Barking Frog	YL
	Couch's Spadefoot Toad	YL
	Western Spadefoot Toad	YL
	Plains Spadefoot Toad	YL
	Woodhouse's Toad	YL
	Great Plains Toad	YL
	Texas Toad	YL
	Green Toad	YL
	Red-Spotted Toad	YL
	**Blanchard's Cricket Frog	YL
	Leopard Frog	YL
	Bullfrog	YL
Reptiles	Snapping Turtle	YL
	Yellow Mud Turtle	YL
	Painted Turtle	YL
	Cooter Turtle	YL
	Pond Slider	YL
	Greater Earless Lizard	YL
	Tree Lizard	YL
	Great Plains Skink	YL
	Many-Lined Skink	YL
	Western Whiptail	YL
	Ringneck Snake	YL
	Coachwhip	YL
	Corn Snake	YL
	Bull or Gopher Snake	YL
	Common Kingsnake	YL
	**Blotched Plain-Bellied Water Snake	YL
	Common Garter Snake	YL
	Black-Necked Garter Snake	YL
	Checkered Garter Snake	YL
	**Pecos Western Ribbon Snake	YL
	Plains Black-Headed Snake	YL
	Western Black-Headed Snake	YL
	Western Diamondback Rattlesnake	YL
	*Mottled Rock Rattlesnake	YL
	Western Rattlesnake	YL
Birds	Common Loon	MW
	Western Grebe	MW
	Eared Grebe	MWB
	Pied-Billed Grebe	MYL
	Horned Grebe	MW
	White Pelican	MWB
	Double-Crested Cormorant	YL
	Wood Ibis	M
	White-Faced Ibis	M
	Common Egret	YL
	Snowy Egret	MB
	Great Blue Heron	YL
	**Little Blue Heron	MB
	Green Heron	YL
	Louisiana Heron	W
	Black-Crowned Night Heron	YL
	American Bittern	MB
	Least Bittern	MB
	Whistling Swan	MW
	Canada Goose	MW
	White-Fronted Goose	MW
	Snow Goose	MW
	Ross' Goose	MW
	Blue Goose	MW
	Mallard	MW
	Pintail	MW
	Gadwall	MWB
	American Widgeon	MWB
	Blue-Winged Teal	MW
Birds (continued)	Cinnamon Teal	MWB
	Green-Winged Teal	MW
	Wood Duck	MW
	Redhead	MW
	***Canvasback	MW
	Ring-Necked Duck	MW
	Lesser Scaup	MW
	Common Goldeneye	MW
	Buffelhead	MW
	White-Winged Scoter	M
	Ruddy Duck	MYL
	Common Merganser	MWB
	Hooded Merganser	MW
	Shoveler	MW
	Lesser Sandhill Crane	MW
	Virginia Rail	MB
	Sora	M
	Common Gallinule	MWB
	American Coot	MYL
	Purple Gallinule	MB
	American Avocet	MB
	Black-Necked Stilt	MB
	Black-Bellied Plover	M
	Snowy Plover	M
	Semipalmated Plover	M
	Killdeer	MYL
	Common Snipe	MW
	Long-Billed Curlew	MWB
	***Upland Plover	M
	Spotted Sandpiper	MW
	White-Rumped Sandpiper	M
	Solitary Sandpiper	M
	Willet	M
	Greater Yellowlegs	M
	Lesser Yellowlegs	M
	Baird's Sandpiper	M
	Least Sandpiper	MW
	Dunlin	MW
	Long-Billed Dowitcher	MW
	Stilt Sandpiper	M
	Western Sandpiper	M
	Marbled Godwit	M
	Sanderling	M
	Pectoral Sandpiper	M
	Wilson's Phalarope	MB
	Northern Phalarope	M
	Herring Gull	MW
	Ring-Billed Gull	MWB
	Franklin's Gull	M
	Bonaparte Gull	MW
	Forster's Tern	M
	**Least Tern	M
	***Black Tern	M
	Sabine Gull	M
	Turkey Vulture	MB
	**Mississippi Kite	B
	Goshawk	MW
	***Cooper's Hawk	MW
	***Sharp-Shinned Hawk	MW
	***Marsh Hawk	MWB
	Rough-Legged Hawk	MW
	Ferruginous Hawk	MYL
	Red-Tailed Hawk	MYL
	***Swainson's Hawk	MB
	***Harris' Hawk	YL
	Golden Eagle	MYL
	Bald Eagle	MW
	**Osprey	MB
	***Prairie Falcon	MW
	***Merlin	MW
	***Kestrel	MYL

* State or Federal Endangered Group I
** State Endangered Group II
*** Audubon Society's Blue List
M Migrant
W Winter
B Breeds
YL Yearlong

CLASS OF ANIMAL	COMMON NAME	SEASON OF USE
Birds (Continued)	*Peregrine Falcon	MW
	Scaled Quail	YL
	Ring-Necked x White Winged Pheasant	YL
	Band-Tailed Pigeon	MB
	Rock Dove or Domestic Pigeon	YL
	White-Winged Dove	MB
	Mourning Dove	YL
	Inca Dove	MB
	Ground Dove	YL
	Yellow-Billed Cockoo	MB
	Roadrunner	YL
	Barn Owl	YL
	Screech Owl	YL
	Great Horned Owl	
	Burrowing Owl	YL
	Long-Eared Owl	MW
	Short-Eared Owl	MW
	Spotted Owl	M
	Poor-Will	MB
	Common Nighthawk	MB
	Lesser Nighthawk	MB
	Chimney Swift	MB
	White-Throated Swift	MWB
	Black-Chinned Hummingbird	B
	Broad-Tailed Hummingbird	M
	Rufous Hummingbird	MB
	Belted Kingfisher	MBYL
	Yellow-Shafted Flicker	MW
	Red-Shafted Flicker	
	**Red-Headed Woodpecker	MB
	Yellow-Bellied Sapsucker	MW
	Williamson's Sapsucker	M
	Ladder-Backed Woodpecker	Y
	Eastern Kingbird	M
	Western Kingbird	MB
	Cassin's Kingbird	MB
	Scissor-Tailed Flycatcher	MB
	Ash-Throated Flycatcher	MB
	Eastern Phoebe	W
	Black Phoebe	YL
	Say's Phoebe	MY
	Traill's Flycatcher	M
	Western Flycatcher	M
	Western Wood Pewee	MB
	Olive-Sided Flycatcher	M
	Vermilion Flycatcher	YL
	Violet Green Swallow	M
	Tree Swallow	M
	Bank Swallow	M
	Rough-Winged Swallow	MB
	Cliff Swallow	MB
	Barn Swallow	MB
	Mockingbird	MYL
	Catbird	M
	Brown Thrasher	MW
	Curve-Billed Thrasher	MY
	Crissal Thrasher	YL
	Sage Thrasher	M
	Steller's Jay	M
	Scrub Jay	
	Common Raven	W
	White-Necked Raven	YL
	Plain Titmouse	YL
	Verdin	YL
	Common Bushtit	YL
	Dipper	M
	White-Breasted Nuthatch	M
	Red-Brested Nuthatch	M
	Pygmy Nuthatch	M
	Brown Creeper	MW
	House Wren	M
	Winter Wren	M
	Bewick's Wren	M
	Cactus Wren	YL
	Long-Billed Marsh Wren	MW
	Rock Wren	MW
	Robin	YL
	Hermit Thrush	M
Birds (Continued)	Eastern Bluebird	MW
	Western Bluebird	MW
	Mountain Bluebird	MW
	Townsend's Solitaire	MW
	Golden-Crowned Kinglet	MW
	Ruby-Crowned Kinglet	MW
	Water Pipit	MW
	Bohemian Waxwing	MW
	Cedar Waxwing	MW
	Phainopepla	YL
	Loggerhead Shrike	YL
	Starling	MW
	**Bell's Vireo	B
	Solitary Vireo	M
	Warbling Vireo	M
	Orange-Crowned Warbler	M
	Virginia's Warbler	M
	Nashville Warbler	M
	Yellow Warbler	M
	Myrtle Warbler	M
	Audubon's Warbler	M
	Black-Throated Gray Warbler	M
	Townsend's Warbler	M
	Kentucky Warbler	M
	MacGillivray's Warbler	M
	Wilson's Warbler	M
	Yellowthroat	MB
	Yellow-Breasted Chat	B
	American Redstart	M
	House Sparrow	YL
	Eastern Meadowlark	YL
	Western Meadowlark	YL
	Yellow-Headed Blackbird	YL
	Red-Winged Blackbird	YL
	Orchard Oriole	MB
	Hooded Oriole	MB
	Scott's Oriole	MB
	Bullock's Oriole	MB
	Brewer's Blackbird	MW
	Boat-Tailed Grackle	YL
	Brown-Headed Cowbird	MYL
	Western Tanager	M
	Summer Tanager	MB
	Cardinal	M
	Pyrrhuloxia	YL
	Rose-Breasted Grosbeak	M
	Black-Headed Grosbeak	M
	Indigo Bunting	B
	Lazilu Bunting	M
	**Painted Bunting	B
	Evening Grosbeak	MW
	Blue Grosbeak	MB
	House Finch	YL
	Pine Siskin	MW
	American Goldfinch	MW
	Lesser Goldfinch	YL
	Red Crossbill	M
	Green-Tailed Towhee	M
	Rufous-Sided Towhee	YL
	Brown Towhee	YL
	Lark Bunting	MWB
	Savannah Sparrow	MW
	Grasshopper Sparrow	M
	Lark Sparrow	MB
	Black-Throated Sparrow	MYL
	Sage Sparrow	MW
	Slate-Colored Junco	MW
	Oregon Junco	MW
	Gray-Headed Junco	M
	Chipping Sparrow	MW
	Clay-Colored Sparrow	M
	Brewer's Sparrow	MW
	Field Sparrow	MW
	Harris' Sparrow	MW
	White-Crowned Sparrow	MW
	Golden-Crowned Sparrow	MW
	White-Throated Sparrow	M
	Fox Sparrow	M

CLASS OF ANIMAL	COMMON NAME	SEASON OF USE
Birds (Continued)	Lincoln's Sparrow	M
	Song Sparrow	MW
	Dickcissel	MB
Mammal	Leafnose Bat	MB
	Cave Myotis	MB
	Long-Legged Myotis	MB
	California Myotis	MB
	Western Pipistrel	MB
	Townsends Big-Eared Bat	MB
	Pallid Bat	MB
	Brazilian Freetail Bat	MB
	Big-Freetail Bat	MB
	Pocketed Freetail Bat	MB
	Racoon	YL
	Ringtail	YL
	Longtail Weasel	YL
	Spotted Skunk	YL
	Stripped Skunk	YL
	Hognose Skunk	YL
	Coyote	YL
	Gray Fox	YL
	Bobcat	YL
	Plains Pocket Gopher	YL
	Silky Pocket Mouse	YL
	Hispis Pocket Mouse	YL
	Bannertail Kangaroo Rat	YL
	Ord	YL
	Merriam	YL
	Beaver	YL
	Western Harvest Mouse	YL
	White-Footed Mouse	YL
	Deer Mouse	YL
	Brush Mouse	YL
	Whitethroat Woodrat (Packrat)	YL
	Southern Plains Woodrat (Packrat)	YL
	Hispid Cotton Rat	YL
	Muskrat	YL
	Norway Rat	YL
	House Mouse	YL
	Porcupine	YL
	Blacktail Jackrabbit	YL
	Desert Cottontail	YL
	Mule Deer	YL
	Armadillo	YL
Insects	Lady Bug or Ladybird Beetles	
	Broomweed Longhorn Beetle	
	Mourning-Cloak Butterfly	
	Swallowtail Butterfly	
	Polyphemus Moth	
	Tent Caterpillars	
	Painted Lady	
	Rangeland Caterpillar	
	Damsel Fly	
	Dragonflies	
	Mosquitoes	
	Horse or Deer Flies	
	House Fly	
	Migratory Grasshopper	
	Field Cricket	
	Lubberly Locust	
	Desert Grasshopper	
	Carolina Locust	
	Lesser Migrating Locust	
	Yellow Jacket	
	Honey Bee	
	Bumble Bee	
	Water Strider	
	Backswimmer	
	Water Boatman	
Insects (Continued)	Cactus Cicadid	
	Squash Bug	
	Giant Water Bugs	
	Common Centipede	
	Grammarus	
	Trantula Spider	
	Black-Widow Spider	
	Desert Scorpion	
	Whip-Tail Scorpion	

* State or Federal Endangered Group I
** State Endangered Group II
*** Audubon Society's Blue List
M Migrant
W Winter
B Breeds
YL Yearlong

MAJOR HABITAT TYPES AND RELATED ANIMAL SPECIES

SPECIES	SEASON OF USE
RIPARIAN HABITAT	
FISH	
Bigscale Logperch	YL
Black Bullhead	YL
Channel Catfish	YL
Flathead Catfish	YL
White Bass	YL
Green Sunfish	YL
Warmouth	YL
Bluegill	YL
Longear Sunfish	YL
Largemouth Black Bass	YL
White Crappie	YL
Black Crappie	YL
Black Buffalofish	YL
Spotted Bass	YL
Southwestern Plains Killifish	YL
Texas Shiner	YL
**Rainwater Killifish	YL
**Pecos Darter	YL
**Bigscale Logperch	YL
**Gray Redhorse	YL
**Roundnose Minnow	YL
**Mexican Tetra	YL
**Greenthroat Darter	YL
**Pecos Pupfish	YL
*Silverband Shiner	YL
*Gray Redhorse	YL
*Prosperpine Shiner	YL
*Blue Sucker	YL

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*** Audubon Society's Blue List
M Mibrant
W Winter
B Breeds
YL Yearlong

MAJOR HABITAT TYPES AND RELATED ANIMAL SPECIES

DRAINAGES, DRAWS, CANYON HABITAT

SPECIES	SEASON OF USE	SPECIES	SEASON OF USE	SPECIES	SEASON OF USE
REPTILES & AMPHIBIANS		BIRDS		MAMMALS	
**Eastern Barking Frog	YL	***Coopers Hawk	YL	Grey Shrew	YL
Coach's Spadefoot Toad	YL	Red-tailed Hawk	BW	Raccoon	YL
Western Spadefoot Toad	YL	Swainson's Hawk	B	Ringtail	YL
Plains Spadefoot Toad	YL	Ferruginous Hawk	BW	Longtail Weasel	YL
Great Plains Toad	YL	***Kestrel	YL	Striped Skunk	YL
Red-spotted Toad	YL	Scaled Quail	BW	Hognose Skunk	YL
Texas Banded Gecko	YL	Mourning Dove	YL	Coyote	YL
Crevice Spiny Lizard	YL	Roadrunner	BW	Gray Fox	YL
Lesser Earless Lizard	YL	Barn Owl	BW	Bobcat	YL
Greater Earless Lizard	YL	Screech Owl	YL	Plains Pocket Mouse	YL
Leopard Lizard	YL	Great-horned Owl	YL	Merriam's Pocket Mouse	YL
Eastern Fence Lizard	YL	Pygmy Owl	YL	Silky Pocket Mouse	YL
Side-blotched Lizard	YL	Flicker	YL	Desert Pocket Mouse	YL
Texas Horned Lizard	YL	Ladder-backed Woodpecker	YL	Nelson's Pocket Mouse	YL
Many-lined Skink	YL	Scissor-tailed Flycatcher	B	Hispid Pocket Mouse	YL
Six-lined Whiptail	YL	Eastern Phoebe	W	Plains Harvest Mouse	YL
Texas Spotted Whiptail	YL	Says Phoebe	B	Cactus Mouse	YL
Western Whiptail	YL	White-breasted Nuthatch	M	Deer Mouse	YL
Checkered Whiptail	YL	Bewick's Wren	B	Bush Mouse	YL
**Coachwhip	YL	Cactus Wren	YL	Rock Mouse	YL
Bull Snake	YL	Canyon Wren	YL	N. Grasshopper Mouse	YL
Kingsnake	YL	Rock Wren	YL	White-throated Woodrat	YL
Long-nosed Snake	YL	Winter Wren	W	Porcupine	YL
Plains Black-headed Snake	YL	Blue Jay	W	Desert Cottontail	YL
Night Snake	YL	Crow	W	Mule Deer	YL
Massasauga	YL	Western Bluebird	WM		
Western Diamondback Rattlesnake	YL	Mountain Bluebird	WM		
Western Rattlesnake	YL	Townsend's Solitaire	B		
		Curve-billed Thrasher	B		
		Brown Thrasher	B		
		Crissal Thrasher	B		
		Loggerhead Shrike	YL		
		Northern Oriole	B		
		Pyrrhuloxia	YL		
		Cardinal	WM		
		Indigo Bunting	B		
		Blue Grosbeak	B		
		Myrtle Warbler	WM		
		Audubon's Warbler	WM		
		Yellow Warbler	WM		
		House Finch	B		
		American Goldfinch	WM		
		Lesser Goldfinch	WM		
		Rufous-sided Towhee	YL		
		Brown Towhee	YL		
		Green-tailed Towhee	B		
		Lark Sparrow	B		
		Black-throated Sparrow	YL		
		Rufous-crowned Sparrow	B		
		Dark-eyed Janco	WM		
		Harris' Sparrow	WM		
		White-crowned Sparrow	WM		
		Golden-crowned Sparrow	WM		
		Lincoln's Sparrow	WM		

MIXED DESERT SHRUB HABITAT

REPTILES & AMPHIBIANS		BIRDS		MAMMALS	
**Eastern Barking Frog	YL	Cooper's Hawk	YL	Grey Shrew	YL
Couch's Spadefoot Toad	YL	Red-tailed Hawk	YL	Raccoon	YL
Plains Spadefoot Toad	YL	Swainson's Hawk	B	Ringtail	YL
Western Box Turtle	YL	***Harris' Hawk	YL	Longtail Weasel	YL
Lesser Earless Lizard	YL	Ferruginous Hawk	BWM	Striped Skunk	YL
Greater Earless Lizard	YL	Kestrel	YL	Hognose Skunk	YL
Leopard Lizard	YL	***Marsh Hawk	WM	Coyote	YL
Eastern Fence Lizard	YL	Scaled Quail	YL	Gray Fox	YL
Side-blotched Lizard	YL	Mourning Dove	YL	Bobcat	YL
Texas Horned Lizard	YL	Barn Owl	YL	Plains Pocket Mouse	YL
Round-tailed Lizard	YL	Screech Owl	YL	Merriam's Pocket Mouse	YL
Great Plains Skink	YL	Great-horned Owl	YL	Silky Pocket Mouse	YL
Many-lined Skink	YL	Roadrunner	YL	Desert Pocket Mouse	YL
Little Striped Whiptail	YL	Lesser Nighthawk	B	Nelson's Pocket Mouse	YL

* State or Federal Endangered Group I
** State Endangered Group II
*** Audubon Society's Blue List
YL Yearlong
B Breeds
W Winter
M Migrant

MIXED DESERT SHRUB HABITAT (Continued)

SPECIES	SEASON OF USE	SPECIES	SEASON OF USE	SPECIES	SEASON OF USE
REPTILES & AMPHIBIANS		BIRDS		MAMMALS	
Western Whiptail	YL	Flicker	YL	Hispid Pocket Mouse	YL
Checkered Whiptail	YL	Ladder-backed Woodpecker	YL	Plains Harvest Mouse	YL
Texas Blind Snake	YL	Downy Woodpecker	WM	Cactus Mouse	YL
Western Hognosed Snake	YL	Scissor-tailed Flycatcher	B	Deer Mouse	YL
Coachwhip	YL	Say's Phoebe	B	Bush Mouse	YL
Glossy Snake	YL	Eastern Phoebe	WM	Rock Mouse	YL
Bull Snake	YL	W. Kingbird	B	Northern Grasshopper Mouse	YL
Kingsnake	YL	Ash-throated Flycatcher	B	White-throated Woodrat	YL
Milksnake	YL	White-necked Raven	B	Porcupine	YL
Long-nosed Snake	YL	Bewick's Wren	B	Desert Cottontail	YL
Ground Snake	YL	Cactus Wren	YL	Mule Deer	YL
Plains Black-headed Snake	YL	Loggerhead Shrike	YL	Mexican Ground Squirrel	YL
Western Black-headed Snake	YL	Curve-billed Thrasher	YL	Old Kangaroo Rat	YL
Night Snake	YL	Crissal Thrasher	YL	Black-tailed Jackrabbit	YL
Massasauga	YL	Brown Thrasher	YL	Pronghorn	YL
Western Diamondback Rattlesnake	YL	Sage Thrasher	B		
Western Rattlesnake	YL	W. Meadowlark	YL		
		Cedar Waxwing	WM		
		Northern Oriole	B		
		Western Bluebird	WM		
		Mountain Bluebird	WM		
		Brown Towhee	YL		
		Pyrrhuloxia	YL		
		Green-tailed Towhee	B		
		Lark Bunting	WM		
		***Vesper Sparrow	WM		
		Cassin's Sparrow	B		
		Black-throated Sparrow	B		
		White-throated Sparrow	WM		
		Brewer's Sparrow	B		
		Sage Sparrow	B		
		Horned Lark	WM		
		Roadrunner	YL		

MESQUITE GRASSLAND

SPECIES	SEASON OF USE	SPECIES	SEASON OF USE	SPECIES	SEASON OF USE
REPTILES & AMPHIBIANS		BIRDS		MAMMALS	
Couch's Spadefoot Toad	YL	***Cooper's Hawk	YL	Striped Skunk	YL
Plains Spadefoot Toad	YL	Redtailed Hawk	YL	Coyote	YL
Western Box Turtle	YL	***Swainson's Hawk	B	Bobcat	YL
Green Toad	YL	Marsh Hawk	WM	Mexican Ground Squirrel	YL
Great Plains Toad	YL	Ferruginous Hawk	YL	Desert Pocket Mouse	YL
Texas Toad	YL	***Kestrel	YL	Nelson's Pocket Mouse	YL
Lesser Earless Lizard	YL	Scaled Quail	YL	Merriam's Kangaroo Rat	YL
Greater Earless Lizard	YL	Mourning Dove	YL	Plains Harvest Mouse	YL
Leopard Lizard	YL	***Barn Owl	YL	Northern Grasshopper Mouse	YL
Desert Spiny Lizard	YL	Screech Owl	YL	Cactus Mouse	YL
Eastern Fence Lizard	YL	Great Horned Owl	YL	Deer Mouse	YL
Side-blotched Lizard	YL	Flicker	B	Southern Plains Woodrat	YL
Tree Lizard	YL	Ladder-backed Woodpecker	YL	Desert Cottontail	YL
Texas Horned Lizard	YL	Scissor-tailed Flycatcher	B	Mule Deer	YL
Short-horned Lizard	YL	Says Phoebe	B		
Round-tailed Lizard	YL	Western Kingbird	B		
Great Plains Skink	YL	Ash-throated Flycatcher	B		
Many-Lined Skink	YL	Crow	WM		
New Mexican Whiptail	YL	White-necked Raven	B		
Desert Grassland Whiptail	YL	Bewick's Wren	B		
Six-lined Whiptail	YL	Cactus Wren	YL		
Texas Spotted Whiptail	YL	Brown Thrasher	B		
Western Whiptail	YL	Curve-billed Thrasher	B		
Western Blind Snake	YL	Crissal Thrasher	B		
Texas Blind Snake	YL	Sage Thrasher	B		
Western Hognose Snake	YL	Loggerhead Shrike	YL		
Coachwhip	YL	Western Meadowlark	YL		
Glossy Snake	YL	Western Bluebird	WM		
Bull Snake	YL	Mountain Bluebird	WM		
King Snake	YL	Cedar Waxwing	WM		
Long-nosed Snake	YL	Northern Oriole	B		
Black-necked Garter Snake	YL	Pyrrhuloxia	YL		
Checkered Garter Snake	YL	Brown Towhee	YL		
Ground Snake	YL	Green-tailed Towhee	B		
Plains Black-headed Snake	YL	Lark Bunting	WM		
Western Black-headed Snake	YL	Lark Sparrow	B		
Night Snake	YL	***Vesper Sparrow	WM		
Massasuga	YL	Cessin's Sparrow	B		
Western Diamondback Rattlesnake	YL	Brewer	B		
Western Rattlesnake	YL	Black-throated Sparrow	B		
		White-crowned Sparrow	WM		

MESQUITE GRASSLAND (Continued)

BIRDS

SPECIES	SEASON OF USE
Roadrunner	YL
Horned Lark	WM
Cassin's Sparrow	B
Black-throated Sparrow	B

CREOSOTE HABITAT

REPTILES & AMPHIBIANS

SPECIES	SEASON OF USE
**Eastern Barking Frog	YL
Couch's Spadefoot Toad	YL
Great Plains Toad	YL
Red-spotted Toad	YL
Texas Banded Gecko	YL
Lesser Earless Lizard	YL
Greater Earless Lizard	YL
Leopard Lizard	YL
Crevice Spiny Lizard	YL
Eastern Fence Lizard	YL
Side-blotched Lizard	YL
Round-tailed Horned Lizard	YL
Many-lined Skink	YL
Six-lined Whiptail	YL
Texas Spotted Whiptail	YL
Western Whiptail	YL
Texas Blind Snake	YL
Coachwhip	YL
Glossy Snake	YL
Bull Snake	YL
Long-nosed Snake	YL
Ground Sanke	YL
Western Black-headed Snake	YL
Western Diamondback Rattlesnake	YL

BIRDS

SPECIES	SEASON OF USE
Red-tailed Hawk	YL
Ferruginous Hawk	WM
***Swainson's Hawk	B
***Kestrel	YL
***Harris' Gawj	YL
Scaled Quail	YL
Crissal Thrasher	B
Western Meadowlark	YL
Grasshopper Sparrow	B
Lark Bunting	WM
Lark Sparrow	B
***Vesper Sparrow	WM
Cassin's Sparrow	B
Black-throated Sparrow	B
Horned Lark (shortgrass)	WM
Roadrunner	YL

MAMMALS

SPECIES	SEASON OF USE
Striped Skunk	YL
Coyote	YL
Bobcat	YL
Mexican Ground Squirrel	YL
Desert Pocket Mouse	YL
Nelson's Pocket Mouse	YL
Merriam's Kangaroo Rat	YL
Plains Harvest Mouse	YL
Northern Grasshopper Mouse	YL
Cactus Mouse	YL
Deer Mouse	YL
Southern Plains Woodrat	YL
Desert Cottontail	YL
Mule Deer	YL

SHORTGRASS HABITAT

REPTILES & AMPHIBIANS

SPECIES	SEASON OF USE
Couch's Spadefoot Toad	YL
Western Spadefoot Toad	YL
Plains Spadefoot Toad	YL
Great Plains Toad	YL
Texas Toad	YL
Western Box Turtle	YL
Eastern Fence Lizard	YL
Short-horned Lizard	YL
Many-lined Skink	YL
Little Striped Whiptail	YL
Six-lined Whiptail	YL
Texas Blind Snake	YL
Glossy Snake	YL
King Snake	YL
Long-nosed Snake	YL
Plains Black-headed Snake	YL
Massasauga	YL
Western Diamondbacked Rattlesnake	YL
Western Rattlesnake	YL

BIRDS

SPECIES	SEASON OF USE
Mountain Plover	WM
American Golden Plover	WM
Long-billed Curlew	WM
***Upland Plover	WM
**Mississippi Kite	B
***Marsh Hawk	WM
Rough-legged Hawk	WM
Red-tailed Hawk	YL
Ferruginous Hawk	BW
***Swainson's Hawk	BM
Golden Eagle	WM
***Prairie Falcon	WM
***Kestrel	YL
*Peregrine Falcon	M
Scaled Quail	YL
Mourning Dove	YL
Roadrunner	YL
***Burrowing Owl	YL
***Short-eared Owl	W
Common Night Hawk	B
Lesser Nighthawk	B
Scissor-tailed Flycatcher	B
Horned Lark	W
White-necked Raven	B
Sprague's Pipit	WM
Western Meadowlark	YL
Lark Bunting	WM
Grasshopper Sparrow	B
**Baird's Sparrow	WM
Lark Sparrow	B
***Vesper Sparrow	WM
Cassin's Sparrow	B
**McCown's Longspur	WM
Chestnut-collared Longspur	WM
Dickcissel	WM

MAMMALS

SPECIES	SEASON OF USE
Badger	YL
Striped Skunk	YL
Coyote	YL
Swift Fox	YL
Kit Fox	YL
Thirteen-lined Ground Squirrel	YL
Merriam's Pocket Mouse	YL
Silky Pocket Mouse	YL
Plains Harvest Mouse	YL
Western Harvest Mouse	YL
Deer Mouse	YL
Northern Grasshopper Mouse	YL
Black-tailed Jackrabbit	YL
Pronghorn Antelope	YL

SHINNERY OAK/DUNE HABITAT

REPTILES & AMPHIBIANS

SPECIES	SEASON OF USE
Side-blotched Lizard	YL
Lesser Earless Lizard	YL
Leopard Lizard	YL
Eastern Fence Lizard	YL
Round-tailed Horned Lizard	YL
**Sandune Sagebrush Lizard	YL
Six-lined Whiptail	YL
Western WHiptail	YL
Texas Blind Snake	YL
Western Hognosed Snake	YL
Bull Snake	YL
Massasauga	YL
Western Diamondbacked Rattlesnake	YL
Western Rattlesnake	YL

BIRDS

SPECIES	SEASON OF USE
***Marsh Hawk	WM
Rough-legged Hawk	WM
Red-tailed Hawk	YL
Ferruginous Hawk	WM
***Swainson's Hawk	BM
***Harris' Hawk	B
***Kestrel	YL
Scaled Quail	YL
Mourning Dove	YL
Roadrunner	YL
***Burrowing Owl	YL
White-necked Raven	B
Cactus Wren	YL
Loggerhead Shrike	YL
W. Meadowlark	YL
Pyrrhuloxia	YL
House Finch	B
Grasshopper Sparrow	B
**Baird's Sparrow	B
Lark Sparrow	B
***Vesper Sparrow	WM
Cassin's Sparrow	B
Sage Sparrow	W
Brewer's Sparrow	W

MAMMALS

SPECIES	SEASON OF USE
Badger	YL
Spriped Skunk	YL
Coyote	YL
Plains Pocket Mouse	YL
Desert Pocket Mouse	YL
Merriam's Kangaroo Rat	YL
Deer Mouse	YL
Northern Grasshopper Mouse	YL
Blacktail Jackrabbit	YL
Desert Cottontail	YL
Mule Deer	YL
Spotted Ground Squirrel	YL
Plains Pocket Gopher	YL
Silky Pocket Mouse	YL
Ord's Kangaroo Rat	YL

BROADLEAF TREE HABITAT (UPLAND)

REPTILES & AMPHIBIANS

SPECIES	SEASON OF USE
Coach's Spadefoot Toad	YL
Western Spadefoot Toad	YL
Plains Spadefoot Toad	YL
Great Plains Toad	YL
Red-spotted Toad	YL
Leopard Lizard	YL
Eastern Fence Lizard	YL
Side-blotched Lizard	YL
**Coachwhip	YL
Bull Snake	YL
Kingsnake	YL
Long-nosed Snake	YL
Plains Black-headed Snake	YL
Night Snake	YL
Massasauga	YL
Western Diamondback Rattlesnake	YL
Black-tailed Rattlesnake	YL
Western Rattlesnake	YL

BIRDS

SPECIES	SEASON OF USE
***Cooper's Hawk	YL
Red-Tailed Hawk	BW
***Swainson's Hawk	B
Ferruginous Hawk	BW
***Kestrel	YL
Scaled Quail	BW
Mourning Dove	YL
Roadrunner	BW
***Barn Owl	BW
Screech Owl	YL
Great-horned Owl	YL
Long-eared Owl	YL
Pygmy Owl	YL
Flicker	YL
Red-headed woodpecker	S
Ladder-backed Woodpecker	YL
Scissor-tailed Flycatcher	B
Eastern Phoebe	W
Say's Phoebe	B
White-breasted Nuthatch	M
Bewick's Wren	B
Cactus Wren	YL
Winter Wren	W
Blue Jay	W
Crow	W
Western Bluebird	WM
Mountain Bluebird	WM
Townsend's Solitaire	B
Curve-billed Thrasher	B
Brown Thrasher	B
Loggerhead Shrike	YL
Northern Oriole	B
Pyrrhuloxia	YL
Cardinal	WM
Indigo Bunting	B
Blue Grosbeak	B
Myrtle Warbler	WM
Audubon's Warbler	WM
Yellow Warbler	WM
Verdin	YL
House Finch	B
American Goldfinch	WM
Lesser Goldfinch	WM
Rufous-sided Towhee	YL
Brown Towhee	YL
Green-tailed Towhee	B
Lark Sparrow	B
Black-throated Sparrow	YL
Rufous-crowned Sparrow	B
Dark-eyed Janco	WM
Harris' Sparrow	WM
White-crowned Sparrow	WM
Golden-crowned Sparrow	WM
Lincoln's Sparrow	WM

MAMMALS

SPECIES	SEASON OF USE
Raccoon	YL
Longtail Weasel	YL
Striped Skunk	YL
Hognose Skunk	YL
Coyote	YL
Gray Fox	YL
Bobcat	YL
Plains Pocket Mouse	YL
Merriam's Pocket Mouse	YL
Nelson's Pocket Mouse	YL
Hispid Pocket Mouse	YL
Plains Harvest Mouse	YL
Deer Mouse	YL
Bush Mouse	YL
Northern Grasshopper Mouse	YL
White-throated Woodrat	YL
Porcupine	YL
Desert Cottontail	YL
Mule Deer	YL

GLOSSARY

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GLOSSARY

ACRES PER ANIMAL UNIT MONTH. Number of acres to sustain the equivalent of one cow with one calf, or five sheep for one month.

ACTUAL USE. The use made of forage on any area by livestock and/or game animals without reference to permitted or recommended use. It is usually expressed in terms of animal unit months or animal units.

ACUTE ORAL LD50. An amount of a chemical which will kill (lethal dose) 50 percent of a test population.

ADJUDICATION. The apportionment of grazing use on public range among eligible applicants.

ADJUSTMENT. Change in animal numbers, seasons of use, kinds or classes of animals, or management practices as warranted by specific conditions.

AGGREGATE (soil). Combinations of primary soil particles that have formed secondary particles or units.

AIR INVERSION. The trapping of a layer of cold air at the surface of the ground by a layer of warm air above it, preventing the normal rising of surface air.

AIR-DRY WEIGHT. The weight of a substance after it has been allowed to dry to equilibrium with the atmosphere.

ALLOTTEE. Holder of a license or permit for grazing on an allotment.

ALLOTMENT. An area designated for the use of a prescribed number and kind of livestock.

ALLOTMENT MANAGEMENT PLAN (AMP). A concisely written program of livestock grazing management, including supportive measures, if required, designed to attain specific management goals in an allotment.

ALLUVIUM. Materials transported and redeposited by water. There are two groups: (1) Local alluvium, like that found at the base of slopes, along small streams flowing from small drainage basins of nearly homogeneous rock and soil material, and (2) general alluvium of mixed origin, as along major stream courses.

ANIONS. Negatively charged ions which migrate to the anode in an electrolyzed solution.

ANIMAL-UNIT (AU). Considered to be one mature (950 lb.) cow or the equivalent based upon average daily forage consumption of 26 lbs. of matter per day.

ANIMAL-UNIT MONTH (AUM). The amount of feed or forage required to sustain one cow or one horse or five sheep or 9.5 deer or 14.5 antelope for one month.

ANNUALS. Plants produced from seed which complete their life cycle in one growing season.

APPARENT TREND. The visual assessment of ecological trend, based on a single observation.

AQUIFER. A geologic formation capable of transmitting water through its pores at a rate sufficient for water supply purposes. The term "water-bearing" is sometimes used synonymously with aquifer when a stratum furnishes water for a specific use. Aquifers are usually saturated sands, gravel, fractures, caverns, or vesicular rock.

ARCHAIC. A cultural tradition generally following the Paleo-Indian tradition. In this area, dates approximately 400 to 1,000 years ago.

ARCHEOLOGY. The scientific study of historic or prehistoric people and their cultures by analysis of their artifacts, inscriptions, and skeletal remains found in or on the earth.

ARCHEOMAGNETIC DATING. A method of dating based on the fact that the intensity and direction of the earth's magnetic field varies through time.

ARID. A term applied to regions or climates where lack of sufficient moisture severely limits growth and production of vegetation. The limits of precipitation vary considerably according to temperature conditions, with an upper annual limit for cool regions of 10 inches or less and for tropical regions as much as 15 to 20 inches.

ARTIFACT. An object produced or shaped by human workmanship; especially, a simple tool, weapon, or ornament of archeological or historical interest.

ARROYO. The term used for gully in the southwestern U.S.A. Syn., Coulee, donga, gully, draw.

ASPECT (Vegetation). The appearance that a dominant or most common species of vegetation gives to the viewer, i.e., shortgrass, pinyon-juniper, etc.

ASSOCIATION. A mapping unit used on generalized soil maps in which two or more defined taxonomic units occurring together in a characteristic pattern are combined.

BASAL AREA. The area of ground surface covered by the stem or stems of a range plant, usually measured 1 inch above the soil in contrast to the full spread of the foliage.

BASIC ELEMENTS. The four major elements (form, line, color, and texture) which determine how the character of a landscape is perceived.

BEDROCK. The solid rock underlying the soil and other unconsolidated materials or appearing at the surface where these are absent.

BIOACCUMULATION. The buildup over time of chemicals in an organism.

BIOMASS. The amount of living matter in a specified area.

BOLSON. A flat-floored desert valley that drains to a playa.

BROWSE. (n) That part of leaf and twig growth of shrubs, woody vines and trees available for animal consumption. (v) To consume browse.

BROWSER. An animal that feeds on the leaves, buds, and twigs of woody plants.

BRUSH. A growth of shrubs or small trees which is usually undesirable for livestock. It may sometimes be of value for browse and for watershed protection.

BRUSH CONTROL. Removal of brush to reduce its competition with more desirable species for space, moisture, light, and nutrients.

BRUSH MANAGEMENT. Management and manipulation of stands of brush to achieve specific management objectives.

BUNCH GRASS. A grass so-called because of its characteristic growth habit of forming a bunch.

CALF CROP. The number of calves weaned from a given number of cows bred, usually expressed in percentages.

CALVING PERCENTAGE. Number of calves weaned as a percentage of the number of cows bred.

CAMBIUM. A thin formative layer between the xylem and phloem of most vascular plants that gives rise to new cells and is responsible for secondary growth.

CARBONATIC. Soil or geologic materials enriched with calcium carbonates.

CARCINOGENIC. An agent or compound which causes cancer.

CARRYING CAPACITY. The maximum stocking rate possible without inducing damage to vegetation or related resources. It may vary from year to year on the same area due to fluctuating forage production.

CATIONS. Positively charged ions which migrate to the cathode in an electrolyzed solution.

CATTLE GUARD. A device or structure, at points where roads cross a fence line, that is so designed that vehicular travel is uninterrupted, but crossing by all kinds of livestock is restricted.

CERAMICS. Archeological term for pottery objects made from clay.

CERAMIC TIME PERIOD. A term generally used to indicate the time period which follows the Archaic time period. In the ES area, the ceramic time period dates from 950-1450 A.D.

CHANGING SEASON OF USE. Adjusting the time of livestock grazing on a range area, based on type of vegetation or stage of vegetative growth.

CHEMICAL CONTROL (Vegetation). Utilization of chemicals to control dominant or undesirable species in order to reduce competition with native or previously seeded, desirable species.

CLASS OF ANIMAL. Age and/or sex-group of a kind of animal. Example: cow, calf, yearling, ewe, doe, fawn, etc.

CLASS OF LIVESTOCK. Age and/or sex-group of a kind of livestock.

CLAY. A mineral soil separate consisting of particles less than 0.002 mm in equivalent diameter.

CLIMATE. The average weather conditions of a place over a period of years.

CLIMAX VEGETATION. The final vegetative community which emerges after a series of successive vegetational stages and perpetuates itself indefinitely unless disturbed by outside forces.

COMMUNAL. A characteristic of animals where members of the same species share a common area for the same purpose.

CONSERVATION. The use and management of natural resources according to principles that assure their sustained, highest economic and/or social benefits without impairment of environmental quality.

CONSTANT DOLLARS. Dollars adjusted for inflation; in this report, all dollar values are given in terms of the value of the dollar in 1978.

CONTRAST RATING. A method of determining the extent of visual impact for an existing or proposed activity that will modify landscape character.

CORRAL. A small enclosure for handling livestock.

COVER. The combined aerial parts of plants and mulch. (2) Shelter and protection for animals and birds.

COW-CALF OPERATION. A cattle business that sells weaned calves at about 9 months of age.

COW-CALF-YEARLING OPERATION. A cattle business that sells weaned calves and yearlings.

CROWN COVER. Area covered by the aerial parts of plants expressed as a percentage of the total area being examined.

CRYPTIC COLORATION. Coloration of animals which enables them to resemble their surroundings.

CULTURAL RESOURCES. A term that includes resources of historical, archeological, or architectural significance which are fragile, limited, and nonrenewable portions of the human environment.

DEFERRED GRAZING. The use of deferment in grazing management of a management unit, but not in a systematic rotation including other units.

DEGREE OF USE. That proportion of the current year's forage production which is consumed and/or destroyed by grazing animals. May refer either to a single species or to the vegetation as a whole.

DENSITY. General estimate of overhead (vertical) ground cover given as a percentage.

DESIRABLE PLANTS. Plants which are palatable and productive forage species and which are often dominant under or near climax conditions. These plants normally are long-lived, and have deep, fibrous roots to protect the watershed against erosion. This category includes the important key species (grasses, forbs, and browse) which are to be maintained or increased by allotment-specific livestock management.

DIAGNOSTIC LITHICS. Distinctive stone tools which are indicative of a specific time period and/or function.

DIRT TANK. An earthen reservoir constructed to provide livestock and wildlife water.

DISTRIBUTION. The uniformity of livestock grazing use over a range area, affected by water availability, topography, and type and palatability of vegetative species.

DRAW. A natural depression or swale; a small watercourse.

ECOLOGY. The study of the interrelationships of organisms with their environment.

EFFECTIVE ROOT DEPTH. Depth to which a major portion of roots of the most common forage species penetrate the ground.

EMERGENT PLANTS. Plants that are rooted in the ground and extend up through and above water, e.g., cattails.

ENDANGERED SPECIES. Species or subspecies of animal or plant whose prospects of survival and reproduction are in immediate jeopardy.

ENVIRONMENT. The sum of all external conditions that affect an organism or community to influence its development or existence.

ENVIRONMENTAL STATEMENT (ES). A written assessment of the impacts of a proposed project (e.g., a grazing management program) and its alternatives as they affect the human environment.

ENVIRONMENTAL ASSESSMENT RECORD (EAR). A report assessing the impacts of a proposed action on a given environment. It is similar to an Environmental Statement, but it is generally smaller in scope and makes recommendations for action.

EOLIAN. Soil material or deposits which have been transported by wind action.

ERODABILITY. The relative ease with which one soil erodes under specified conditions as compared with other soils under the same conditions.

EROSION CONDITION CLASSES. A classification system for soil erosion which allows a site to be ranked on a scale of 0-100, in increments of 20 points. Value classes are: 0-20 = stable; 21-40 = slight; 41-60 = moderate; 61-80 = critical; 81-100 = severe. The terms used for value classes are largely self-explanatory.

EXCLOSURE. An area fenced to exclude animals.

EXCRETED. Matter eliminated from the blood, tissues, or organs.

FAMILY. One of the groups used to classify plants and animals. A family consists of a number of similar genera (more than one genus).

FAUNA. Animals collectively, especially those of a particular region.

FEDERAL LAND POLICY AND MANAGEMENT ACT OF 1976 (FLPMA). Public Law 94-579 gives the Bureau of Land Management the legal authority to establish public land policy; to establish guidelines for its administration; to provide for the management, protection, development, and enhancement of the public lands; and other purposes.

FEDERALLY LISTED ENDANGERED SPECIES. Those species of animals or plants classified by the Secretary of the Interior or the Secretary of Commerce as endangered, pursuant to Section 4 of the Endangered Species Act of 1973.

FLORA. Plants collectively, especially those of a particular region or time.

FOLIAR. Applying chemical sprays to the leaves (foliage) of plants.

FORAGE. The portion of vegetative production that is properly usable by grazing animals.

FORAGE ACRE. A surface acre of area which is completely covered by competely usable forage.

FORAGE PRODUCTION. The weight of forage that is produced within a designated period of time on a given area. The weight may be expressed as either green, air-dry, or oven-dry.

GRAZE. The consumption of standing forage by livestock or wildlife. (2) To put livestock to feed on standing forage.

GRAZING PREFERENCE. The total number of animal unit months (AUMs) of livestock grazing on public lands apportioned and attached to base water owned or controlled by a permittee or lessee.

GRAZING SYSTEM. A systematic sequence of grazing use and nonuse goals or objectives by improving the quality and quantity of the vegetation.

GRAZING TRESPASS. The grazing of livestock on a range area without proper authority, and resulting from a willful or negligent act (unauthorized use).

GROUND COVER (Vegetation). Vegetative ground cover is living vegetation which covers a point on the ground surface, when viewed from directly overhead, including canopies of trees and shrubs within 20 feet or less of the ground surface and lichens and mosses 1/16 inch or more in thickness.

GROUND COVER (soil) (Hydrologic). All materials which cover the ground surface; includes live vegetation; dead vegetation material (litter) small and large rock.

GROUND WATER. Subsurface water that is in the zone of saturation. The top surface of the ground water is the "water table." Source of water for wells, seepage, and springs.

GROWING SEASON. That portion of the year when temperature and moisture are usually most favorable for plant growth.

GRUBBING. The mechanical act of removing roots of brush plants.

GYP HILLS AND BREAKS. Commonly used as SCS technical term for gypsum soils, etc.

HABITAT. The natural abode of a plant or animal, including all biotic, climatic, and edaphic factors affecting life.

HARDNESS OF WATER. A qualitative expression of the amount of dissolved minerals in water.

HEARTH. In archeology, a term used to describe the area of a cooking fire.

HEAVY GRAZING. A comparative term which indicates that the stocking rate of a pasture is relatively greater than that of other pastures (60-80 percent utilization of current forage production).

HERB. Any flowering plant except those developing persistent woody stems above ground.

HERBICIDE. A chemical used for killing or inhibiting the growth of plants.

IMPACT. An observed effect that occurs in an ecosystem as the result of an environmental perturbation.

INFILTRATION. The movement of water through the soil surface into the soil.

INFILTRATION RATE. Maximum rate at which soil under specified conditions can absorb rain or shallow impounded water, expressed in quantity of water absorbed by the soil per unit of time.

INGEST. Take in by mouth; eat; consume.

INSTANT WILDERNESS STUDY AREAS. The Federal Land Policy and Management Act of 1976 states that wilderness recommendations on all public land areas were formally designated as natural or primitive areas prior to November 1, 1975, will be reported to the President by July 1, 1980. There are 55 such areas, e.g., instant study areas, on the public lands.

INVADER. Plant species that were absent or present in very small amounts in undisturbed portions of the original vegetation of a specific range site and will invade following disturbance or continued overuse.

INVASION. The migration of organisms from one area to another area and their establishment in the latter.

KARST. A limestone plateau marked by sinks, or karst holes, interspersed with abrupt ridges and irregular protuberant rocks, usually underlain by caverns and underground streams.

KEY FORAGE SPECIES. Forage species whose use serves as an indicator to the degree of use of associated species. (2) Those species which must, because of their importance, be considered in the management program.

LAMB CROP. The number of lambs produced by a given number of ewes, usually expressed in the percentage of lambs weaned compared to that of ewes bred.

LAND-USE PLANNING. The process by which decisions are made on future land uses over extended time periods that are deemed to best serve the general welfare.

LANDSCAPE CHARACTER. The arrangement of a particular landscape as formed by the variety and intensity of the four basic elements of form, line, color, and texture.

LARGE COMMERCIAL-SIZE RANCH. A ranch which stocks 500 or more cattle yearlong.

LEACHING. The removal of materials in solution from the soils.

LC$_{50}$. Lethal concentrations of a chemical in animal tissues which will kill 50 percent of a test population.

LESSEE. One who has specified rights or privileges under lease.

LIFE-FORM. Characteristic form or appearance of a species at maturity, e.g., tree, shrub, herb, etc.

LICENSE. An authorization which permits the grazing of a specified number and kind of livestock on a designated area of a grazing district's lands for a specified period of time, usually not in excess of one year.

LIGHT GRAZING. A comparative term which indicates that the stocking rate of one pasture is relatively less than that of other pastures (20 to 40 percent utilization of the current year's forage production).

LITHIC. Materials or artifacts which are made of stone.

LITTER. The primary layer of bulky, coarse, largely undecayed plant residue.

LIVESTOCK DISTRIBUTION. Dispersion of livestock grazing within a management unit.

LIVESTOCK EXCLUSION. Range that is closed to grazing by domestic livestock. (also: livestock exclosure)

LIVESTOCK FLEXIBILITY. The ability to alter the number, or kind, of animals within a livestock enterprise as warranted by variability in forage, economic, weather, or other conditions.

LIVESTOCK MANAGEMENT. Application of technical principles and busi ness methods to livestock production.

LIVESTOCK PRODUCTION. The weight, number of animals, etc., that a particular range, pasture or management system produces. (2) The business of producing livestock.

LONG-RUN. The twenty-year period immediately following the implementation of the proposed action (short run) in which most objectives of the proposed action would be accomplished.

LONG-TERM. The time period beginning twenty-eight years after initiation of the proposed action. This is the period beyond the point at which the most of the objectives of the proposed action have been accomplished.

MAINTENANCE HERD. The livestock retained for breeding purposes to provide for the perpetuation of the herd or band. Excludes animals being prepared for market.

MANAGEMENT AREA. An area for which a single management plan is developed and applied.

MANAGEMENT FRAMEWORK PLAN (MFP). Land use plan for public lands which provides a set of goals, objectives, and constraints for a specific planning area to guide the development of detailed plans for the management of each resource.

MANAGEMENT PLAN. A program of action designed to reach a given set of objectives.

MANO. A hand-held stone used for grinding seeds for food or stone material for pigment. Used in conjunction with a Metate.

MEDIUM COMMERCIAL-SIZE RANCH. A ranch which stocks more than 199 but less than 500 cattle yearlong.

METABOLIC. Synonymous with the general metabolic (metabolism) process.

METABOLITE. A substance which takes part in the process of meta bolism. Metabolism usually involves the breaking-up of complex compounds into simpler ones.

METATE. Slabs of stone used as a base for grinding seeds for food in conjunction with the Mano (Mexican origin).

MG/KG. Milligrams of a liquid per kilogram of body weight.

MICROCLIMATE. The local climate of a given site or habitat of variable size. It consists of the moisture-temperature relationships among plants and the soil.

MICROHABITAT. The immediate environmental area occupied by an animal in contrast to the total environment. Plants, etc., used for food, shelter, etc., which modify temperature, humidity, etc., plus other animals occupying the same space make up the microhabitat.

MODERATE GRAZING. A comparative term which indicates that the stocking rate of a pasture is between the rates of other pastures (40-60 percent utilization of the current year's forage production).

MULTIPLE USE. Harmonious and coordinated use of surface and subsurface resources for more than one purpose without impairment of the land, that will best meet the present and future needs of the people.

MUTAGENIC. An agent or compound which causes genetic mutation.

NATIONAL REGISTER OF HISTORIC PLACES. A register of districts, sites, buildings, structures, and objects which are significant in American history, architecture, archeology, and culture. This Register is maintained by the Secretary of the Interior.

NET RETURNS. Profit remaining after costs have been subtracted from receipts.

NONCONSUMPTIVE USE. Loss of vegetal material due to trampling, weathering, etc.; plant losses other than intake by foraging animals. On a moderately stocked range, nonconsumptive forage loss is generally 25 percent of total annual production.

NONSPECIFIC GRAZING MANAGEMENT. A limited form of resource management employed when the percentage of public land in an allotment is small and/or when the federal land in the allotment is designated for transfer out of public ownership. These ranchers are not required to follow a specified grazing system.

NONTARGET SPECIES. Grass, forb, and shrub species which brush control treatments are not designed to kill.

NONUSE. Absence of grazing use on current year's forage production. (2) An authorization to refrain, temporarily, from placing livestock on public ranges without loss of preference for future consideration.

OBSIDIAN HYDRATION. A method of dating obsidian. A freshly made obsidian surface will absorb available water to form a measurable hydration layer.

OGALLALA AQUIFER. Water-bearing gravels dating from the Pliocene Epoch (2 to 5 million years ago). These gravels underlie the Llano Estacado area of southeastern New Mexico and provide ground water in this ES area.

OFF-ROAD VEHICLE (ORV). Any motorized vehicle designed for or capable of cross-country travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other terrain.

OMNIVOROUS. Describes a diet which consists of a variety of foods, e.g., seeds, insects, lizards, etc.

OPPORTUNITY COSTS. Costs as measured in terms of foregone opportunities to do or to buy other things.

ORDER. One of the groups used to classify animals. An order is composed of similar families. Orders make up a class.

OVERGRAZING. Consumption of vegetation by herbivores beyond the endurance of a plant to survive.

OVERSTOCKING. Placing a number of animals on a given area that will result in overuse if continued to the end of the planned grazing period. Continued overstocking will lead to overgrazing.

OVERUSE. Utilizing an excessive amount of the current year's growth which, if continued, will result in overgrazing and range deterioration.

PALATABILITY. The relish with which a particular species or plant part is consumed by an animal.

PARENCHYMA. An adult plant cell containing chlorophyll which may store nutrients.

PASTURE. A grazing area enclosed and separated from other areas by fence.

PEDIFACTS. Objects created when a large animal such as a cow steps on an artifact and breaks it.

PERCENT USE. Grazing use of current growth, usually expressed as a percent of weight removed.

PERCOLATION. Downward movement of water through soils.

PERMANENT WATER. A watering place which supplies water at all times throughout the year or grazing season.

PERMANENT TREND PLOTS. Plots selected in key areas which are photographed each year in order to observe changes in ground cover, plant vigor, and plant species composition. Photos are taken at or near the end of the grazing use period.

PERMEABILITY. The ability of a soil to absorb water instead of creating water run-off. (2). The property of a porous material that is measured by the rate by volume at which a fluid of unit viscosity passes through unit cross section of the material under a unit-pressure gradient.

PERMITTEE. One who holds a permit to graze livestock on federal lands.

PESTICIDE. Any chemical agent used for control of specific organisms such as insecticides, herbicides, fungicides, etc.

pH. A quantitive expression for the acidity or alkalinity of a solution. The scale ranges from 0 to 14 with pH-7 being neutral, less than 7 being acid, more than 7 is alkaline.

PHENOLOGY. A term used to describe the sequence of events and time of occurrence of the life processes of a plant, e.g., start of growth, bloom stage, seed ripe stage, dormant stage.

PHLOEM. Connecting tissues in plants which transport nutrients.

PHREATOPHYTES. Plants which habitually obtain their water supply from ground water sources.

PHYSIOGRAPHIC. Physical geography.

PHYSIOLOGICAL NEEDS OF PLANTS. Requirements of vegetation to survive, the need to manufacture food, to replenish food reserves, to produce viable seed, and to have new seedlings become established.

PLANT SUCCESSION. The process of vegetational development whereby an area becomes successively occupied by different plant communities of higher ecological order.

PLANT VIGOR. The relative well-being and health of a plant as reflected by its ability to manufacture sufficient food for growth and maintenance.

PLAYA. A nearly-level area at the bottom of a desert (dry) basin, sometimes temporarily covered with water.

POISONOUS PLANT. A plant containing or producing substances that cause sickness, death, or a deviation from normal state of health in animals.

POTABLE. Water which is suitable for drinking.

POTHUNTING. The illegal collection of artifacts.

PPM. Parts per million.

PREDATOR. An animal that preys on one or more other animals.

PREFERRED SPECIES. Species that are preferred by animals and are grazed by first choice.

PRESCRIBED BURNING. The use of fire as a management tool under specified conditions for burning a predetermined area.

PROPER GRAZING. The act of continuously obtaining proper use.

PROPER STOCKING. Placing a number of animals on a given area that will result in proper use at the end of the planned grazing period. Continued proper stocking will lead to proper grazing.

PROPER USE. A degree and time of use of current year's growth which, if continued, will either maintain or improve the range condition, consistent with conservation of other natural resources.

PROPER USE FACTOR (PUF). An index to the grazing use that may be made of forage species, based on a system of range management that will maintain the economically important forage species, or achieve other management objectives such as maintenance of watersheds, recreation values, etc.

PUBLIC LANDS. Lands administered by the Bureau of Land Management and owned by the public.

RADIOCARBON DATING. Dating of an artifact based on the amount of radioactive carbon remaining in a substance.

RANCH. An establishment with specific boundaries, together with its lands and improvements, used for the grazing and production of domestic livestock and/or wildlife.

RANCH FUNDAMENTALISM. Belief or set of beliefs, based on the concept that ranching is superior to any other lifestyle, notwithstanding poor financial returns from ranching.

RANCH WEALTH-CAPITAL POSITION. The value of a ranch in a given market, at a given time.

RANCHER. One who owns, leases, or manages a ranch.

RANGE. (See Rangeland.)

RANGE ADMINISTRATION. The conduct of the affairs of a range.

RANGE CONDITION. The current productivity of a range, relative to what that range is naturally capable of producing.

RANGE CONDITION CLASS. One of a series of arbitrary categories used to classify range condition and usually expressed as either excellent, good, fair, or poor.

RANGE CONDITION TREND. The direction of change in range condition.

RANGE FORAGE. Forage produced on range.

RANGE IMPROVEMENT. Any structure or excavation to facilitate management of range or livestock. (2) Any practice designed to improve range condition or facilitate more efficient utilization of the range. (3) An increase in the grazing capacity of range, i.e., improvement in range condition.

RANGE INVENTORY. An itemized list of resources of a management area such as range sites, range condition classes, range condition trends, range use, estimated proper stocking rates, physical developments, and natural conditions such as water, barriers, etc.

RANGELAND. Land on which the native vegetation is predominantly grasses, grass-like plants, forbs or shrubs suitable for grazing or browsing use. Includes lands revegetated naturally or artifically to provide a forage cover that is managed like native vegetation.

RANGE SUITABILITY. The adaptability of a range to grazing by livestock and/or game.

RANGE TYPE. A mapping unit used in range surveys. It is a relatively homogenous classification unit on the basis of the abundance of vegetation, species composition, slope, exposure, kind of soil, and erosion.

RANGE USER. The individual or organization using rangeland for a specific purpose. Most commonly associated with one having a permit to graze livestock on public land, but a hunter may also be considered a range user.

RECONNAISSANCE. A general examination or survey of a region with reference to its main features, usually as a preliminary to a more detailed survey.

RELATED RESOURCES. Those resources which bear relationship to one another because of common location and interdependency, such as range, game, recreation, watershed, soil, timber, etc.

RENEWABLE RESOURCES. Living resources that are able to reproduce or replace themselves and to increase.

REST PERIOD. A period of deferment included as part of a grazing system.

RHIZOME. A prostrate, elongated stem growing partly or completely beneath the surface of the ground; usually rooting at the nodes and becoming upcurved at the apex.

RIPARIAN VEGETATION. Plants that occur in or adjacent to drainage ways and their floodplains.

RODENT. Any animal of the order Rodentia, and commonly includes the order Lagomorpha, many of which influence the range through such habits as grazing, burrowing, etc. Important range rodents include pocket gophers, prairie dogs, ground squirrels, certain terrestrial mice, kangaroo rats, jack rabbits, and marmots.

ROTATION GRAZING. System of range utilization providing for sequential movement of livestock from one pasture to another to allow for regrowth of vegetation and maintenance of vegetative vigor.

RUN-OFF. The total stream discharge of water, including both surface and subsurface flow, usually expressed in acre-feet of water yield.

RUN-OFF, GROUND WATER. Precipitation which percolates through the soil mantle to the ground water table and is eventually discharged into a stream.

RUN-OFF, SURFACE. That part of run-off that travels over the soil surface to a stream channel.

RUSTLER FORMATION. Sediments composed of anhydrite siltstone, sandstone, dolomite, and shales which were deposited in the Delaware evaporite basin during the late Permian Period (225 million years ago). These are the source of a relatively poor quality of ground water which is suitable for use by livestock.

SACRIFICE AREA. A portion of the range, irrespective of site, that is intentionally overgrazed to obtain efficient overall use of the management area.

SALT GROUND. An area where salt is placed for use by livestock.

SALTING. Providing salt as a mineral supplement for animals. (2) Placing salt on the range in such a manner as to improve distribution of livestock.

SAMPLE. A part of a population taken to estimate a parameter of the whole population.

SEASONAL DISTRIBUTION. The progressive grazing in a sequence of moves from one part of a range to another as vegetation develops. (2) The normal occurrence of precipitation at different periods of the year.

SEASONAL GRAZING. Grazing restricted to a specific season.

SEASON OF USE. The time of livestock grazing on a range area based on type or stage of vegetative growth.

SECTION. One square mile or 640 acres.

SECTION 4 PERMIT. A permit issued by BLM for the licensee to construct a project on public lands. The project must be built to BLM specifications. The licensee has the sole interest in the project on public lands, including maintenance.

SEDIMENT. Waterborne debris and soil/rock particles which are moved from one area and deposited in another by water, i.e., material suspended in water or in air. 2. The matter that settles to the bottom of a liquid.

SHORT-RUN. The eight-year period involved in implementation of the proposed action.

SHORT-TERM. The twenty-eight year period between completion of the East Roswell Grazing Environmental Statement and the time that most objectives of the proposed action would be accomplished. This includes the eight-year implementation period (Short-run) and the twenty-year period following (Long-run).

SILT. Sedimentary material consisting primarily of mineral particles intermediate in size between sand and clay.

SLOPE. A slant or incline of the land surface, measured in degrees from the horizontal, or in percent (defined as the number of feet or meters change in elevation per 100 of the same units of horizontal distance) and characterized by direction (exposure).

SMALL COMMERCIAL-SIZE RANCH. A ranch which stocks more than 74 but less than 200 cattle yearlong.

SOIL. The unconsolidated mineral and organic material on the immediate surface of the earth that serves as a natural medium for the growth of land plants. (2) The unconsolidated mineral matter on the surface of the earth that has been subjected to and influenced by genetic and environmental factors of parent material, climate (including moisture and temperature effects), macro and microorganisms, and topography, all acting over a period of time and producing a product - soil - that differs from the material from which it was derived in many physical, chemical, biological, and morphological properties and characteristics.

SOIL COLLOID. Soil material or particles.

SOIL CONDITION CLASS. One of a series of arbitrary categories based principally on the amount of ground cover weighted by the degree of accelerated erosion used to identify soil stability.

SOIL SERIES. The basic unit of soil classification being a subdivision of a family and consisting of soils which are essentially alike in all major profile characteristics except the texture of the "A" horizon.

SOIL SURFACE FACTOR (SSF). An expression of current erosion activity. Seven categories of surface features are considered in the examination of the area represented by a transect. Both wind and water are considered for each category. The categories are: Soil Movement, Surface Litter, Surface Rock, Pedestaling Rills, Flow Patterns, and Gullies. Numerical values are assigned to each category and are totaled to determine the SSF. The value of the SSF determines the erosion condition class of the transect area.

SPECIES COMPOSITION. The proportions of various plant species in relation to the total on a given area. It may be expressed in terms of cover, density, weight, etc.

SPECIFIC GRAZING MANAGEMENT. A program of grazing management designed for a particular allotment to obtain specific management objectives.

SPRAY DRIFT. The movement of airborne spray particles from the intended area of application.

STAND. A group of plants growing together on a contiguous area.

STATE ENDANGERED (Group I). Species whose prospects of survival or recruitment in the state are in jeopardy.

STATE ENDANGERED (Group II). Species whose prospects of survival or recruitment within the state may become jeopardized in the forseeable future.

STOCKING RATE. The area of land which the operator has allotted to each animal-unit for the entire grazable period of the year. May be expressed as a ratio in various forms such as: A.U./ Section; ac/A.U.; or ac./AUM.

STOCKPOND. A water impoundment made by constructing a dam or by excavating a dugout or both to provide water for livestock and/or wildlife. Syn., pond, farmpond, dirt tank, charco.

STOCKWATER DEVELOPMENT. Development of a new or improved source of stockwater supply, such as well, spring, pond, together with storage and delivery system.

STOLON. A horizontal stem which grows along the surface of the soil and roots at the nodes.

STRATIFICATION. A term used to denote the presence of a number of horizons or strata, where the earlier materials are overlain by materials which were deposited at a later time.

SUBSISTENCE-SIZE RANCH. A ranch which stocks fewer than 75 cattle yearlong.

SUITABILITY. The adaptability of an area to grazing by livestock or wildlife.

SUITABLE RANGE. A Range which is accessible to livestock and which can be grazed on a sustained yield basis without damage to the resource.

SUPPLEMENT. Nutritional additive (salt, protein, phosphorus, etc.) intended to remedy deficiencies of the range diet.

SUPPLEMENTAL FEEDING. Supplying concentrates or harvested feed to correct deficiencies of the range diet.

SUSTAINED YIELD. The continuation of desired animal or forage production.

TANK (DIRT OR EARTHEN). A reservoir of any construction for water storage.

TARGET SPECIES. Noxious brush species for which treatment methods are specifically designed to kill, (e.g., mesquite, creosote). These species seriously reduce herbage production, thus reducing forage production and soil stability.

TERATOGENIC. An agent or the cause of an abnormality. (also: Teratological)

TERM LICENSE OR PERMIT. A document which authorizes grazing on public lands for a stated number of years as contrasted with an annual or temporary license or permit. cf. grazing license or permit.

THERMOLUMINESCENCE. Release of stored energy in the form of light from a substance when it is heated. Used to determine the date when pottery was fired.

TILLERING. A unit of vegetation developing from a specific axillary bud prior to the emergence of the nodal root.

TOXICITY. The degree to which something is harmful or poisonous.

TOXICOLOGICAL. Relating to poisons and their effects on organisms.

TRAIL. A well-defined path created by repeated passage of animals. (2) Controlled directional management of livestock.

TRAILING. Controlled directional movement of livestock. cf. drive. (2) Natural trailing is the habit of livestock or wildlife repeatedly treading in the same line or path.

TRAMPLING. Treading underfoot; the damage to plants or soil brought about by movements or congestion of animals.

TREND. The direction or status of change in range condition: described in this document as up; down; or static.

TRIASSIC ROCKS. Sands, silts, and clays dating from the Triassic Period (200 million years ago) which provide small amounts of ground water.

TYPICAL RANCH. Ranch with average costs, receipts and returns for given size category.

UNAUTHORIZED USE. The grazing of livestock on a range area without proper authority (Grazing trespass).

UNIT RESOURCE ANALYSIS (URA). A comprehensive display of physical resource data and an analysis of the current use, production, condition, and trend of the resources and potentials and opportunities within a planning unit, including a profile of ecological values.

UNSUITABLE RANGE. An area which may have value for wildlife but has no value for, or should not be used by, livestock because of steep topography, barrenness, dense timber, lack of forage, or unstable soils.

UTILIZATION. The proportion of a current year's forage production that is consumed or destroyed by grazing animals, usually expressed as a percentage. May refer either to a single species or to the vegetation as a whole.

VEGETATION. Plants in general, or the sum total of the plant life above and below ground in an area.

VEGETATION TYPE. A plant community with distinguishable characteristics.

VEGETATIVE. Relating to nutritive and growth functions of plant life in contrast to sexual reproductive functions.

VEGETATIVE COMPOSITION. A percentage of the total vegetative spectrum occupied by each species.

VEGETATIVE SUBTYPE. A subdivision of a vegetative type which generally indicates an aspect to the viewer of either a single dominant species, or dominant species similar in appearance.

VIGOR. The state of health of a plant. The capacity of a plant to respond to growing conditions, to make and store food, produce seed, or reproduce vegetatively, that is by stolons or rhizomes.

VOLITILIZATION. The process where a chemical vaporizes at ordinary temperatures upon contact with air.

WATER GAP. An opening or fenced area providing access to a developed or natural water supply permitting one watering facility to serve two or more pastures.

WATERSHED. A total area of land above a given point on a water way that contributes run-off water to the flow at that point. (2) A major subdivision of a drainage basin.

WATERSHED PLANTS. Vegetation which provides ground cover, soil-binding by development of roots, etc., thus decreasing run-off rates and soil erosion. This, in turn, improves the quality of water which flows into other systems.

WELL-BEING. Condition of human happiness and health, measured objectively (with socioeconomic indicators) or subjectively (with individual perceptions).

WILDLIFE. Undomesticated vertebrate animals considered collectively, with the exception of fishes.

WILDLIFE REFUGE. A land area reserved and managed for the benefit of one or more species of wildlife.

YEARLING. An animal approximately one year of age. A short yearling is from 9 to 12 months of age and a long yearling is from 12 to 18 months.

YEARLONG GRAZING. Continuous grazing for a calendar year.

YEARLONG RANGE. Range that is, or can be, grazed yearlong.

ZONING. A means by which governmental authority is used to promote the desired use of land under certain circumstances. This power traditionally resides in the state, and the power to regulate land uses by zoning is usually delegated to minor units of government, such as town, municipalities, and counties, through an enabling act that specifies powers granted and the conditions under which these are to be exercised.

REFERENCES

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References

Advisory Committee on Predator Control. 1972. Predator Control-1971: Report to the Council on Environmental Quality and the Department of the Interior. Institute for Environmental Quality. Ann Arbor, Michigan.

Agee, Douglas E. 1972. "Rates of Return to Investment for Western Cattle Ranches." Journal of the American Society of Farm Managers and Rural Appraisers. 36:2, 53-58. October.

Anderson, B.W., A.E. Higgins, and R.D. Ohmart. 1977. Avian use of Saltcedar Communities in the Lower Colorado River Valley. In: Importance, Preservation and Management of Riparian Habitat: A Symposium, U. S. Department of Agriculture Forest Service Technical Report RM-43:128-136.

Arnold, W.R. and P.W. Santelmann. 1966. "The Response of Native Grasses and Forbs to Picloram," Weeds. 14:74-76.

Austin, G.T. 1970. "Breeding Birds of Desert Riparian Habitat in South Nevada." Condor 72:431-436.

Balda, R.P. 1975. Vegetation Structure and Breeding Bird Diversity. In: Symposium on the Management of Forest Range Habitats for Nongame Birds. U. S. Department of Agriculture Forest Service General Technical Report WO-1: 59-80.

Bartholomew, G.A. 1972. The Water Economy of Seed-Eating Birds that Survive Without Drinking. In: Proceedings of the XV International Ornithological Congress, E.J. Brill. Leiden. 235-254.

Baur, R. J. 1978. "Effects of Picloram and Tebuthiuron on the Establish- of Ryegrass Winter Pasture." Journal of Range Management. 31: 450-455.

Beasom, Samuel L. and C.J. Scifres. 1977. "Population Reactions of Selected Game Species to Aerial Herbicide Applications in South Texas," Journal of Range Management 30:138-142.

Beaver, D.L. 1976. "Avian Populations on Herbicide Treated Brush Fields," Auk. 93:543-553.

Beckett, Patrick H., Mark C. Strong, and Susan H. Strong. 1977. Nomad Trail Archeological Project in Eddy County, New Mexico. BLM Contract No. YA-512-CT6-268. Roswell District Office, Roswell, New Mexico.

Bednarz, J. 1975. A Study of the *Pecos Gambusia*. Unpublished Report to Endangered Species Program. New Mexico Department of Game and Fish. Santa Fe.

Bernard, S.R. and K.F. Brown. 1977. Distribution of Mammals, Reptiles and Amphibians. Physiographic Regions and A.W. Kuchlers Association for the Eleven Western States. BLM Technical Note.

Bignami, M., F. Aulicino, and A. Yelcich. 1977. Mutagenic and Recombinogenic Action of Pesticides in Aspergillus nidulans. First Supplement, Samta, Rome, Italy.

Bock, C.E. and J.A. Bock. 1978. "Response of Birds, Small Mammals, and Vegetation to Burning Sacaton Grasslands in Southeastern Arizona," Journal of Range Management 31:296-300.

Bohmont, B. L. 1967. Toxicity of Herbicides to Livestock, Fish, Honeybees, and Wildlife. In: 20th Western Weed Control Conference Proceedings. 21:25-27.

Bond, F.M. 1972. The Peregrine, Prairie, and Aplomado Falcons in the Southwest. In: Symposium on Rare and Endangered Wildlife of the Southwestern United States. New Mexico Department of Game and Fish. Santa Fe, New Mexico.

Bonham, C.D. and A. Lerwick. 1976. "Vegetation Changes induced by Prairie Dogs on Shortgrass Range," Journal of Range Management. 29:221-226.

Borrecco, J.E. 1937. The Response of Animals to Herbicide-Induced Habitat Changes. M.S. thesis. Oregon State University, Corvallis.

Bostwick, Don, Hohn Schultz and Gordon Rodewald. 1978. Multi-Disciplinary Analysis of Range Management. In: National Economic Analysis Division Working Paper. U. S. Department of Agriculture. Washington, D. C. August.

Bovey, R.W. 1977. Response of Selected Woody Plants in the United States to Herbicides. In: U. S. Department of Agriculture, Agricultural Research Service Agricultural Handbook No. 493.

______, C.C. Dowler and, M.G. Merkle. 1969. "The Persistence and Movement of Picloram in Texas and Puerto Rican Soils," Pesticide Monitor Journal. 3:177-181.

Boyd, J. M. 1960. Studies of the Differences Between the Fauna of Grazed and Ungrazed Grassland in Tiree, Argyll, Scotland. In: Proceedings of the Zoological Society, London 135: 33-54.

Brock, J.H. 1978. Vegetation Zonation Patterns Associated with Honey Mesquite. Ph. D. dissertation, Texas A&M University, College Station.

Bromley, D. W., G. E. Blanch, and H. H. Stoeveres. 1964. Effects of Selected Changes in Federal Land Use on a Rural Economy. In: Oregon Agricultural Experiment Station Bulletin 604, Roseburg, Oregon.

Brown, Albert L. 1950. "Shrub Invasion of Southern Arizona Desert Grassland." Journal of Range Management. 3:172-177.

Brown, D.E. 1978. Grazing, Grassland Cover, and Gamebirds. 43rd North American Wildlife and Natural Resources Conference.

Brown, George W. 1971. Water Temperature in Streams as Influenced by Environmental Factors, In: Symposium Proceedings: Forest Land Uses and Stream Environment. Oregon State University, Corvallis.

Brown, J.W. and J.L. Schuster. 1969. "Effects of Grazing on a Hardland Site in the Southern High Plains,: Journal of Range Management. 22:418-423.

Buffington, L.C. 1964. Vegetational Changes on a Semi-Desert Grassland Range from 1858 to 1963. Ph. D. dissertation. New Mexico State University, Las Cruces.

Buttery, R.F., and P.W. Shields. 1975. Range Management Practices and Bird Habitat Values. In: Proceedings of the Symposium on the Management Forest and Range Habitats for Nongame Bird. U. S. Department of Agriculture Forest Service Technical Report WO-1.

Cable, D.R. 1975. "Influence of Precipitation on Perennial Grass Production in the Semi-Desert Southwest," Ecology. 56:981-986.

_____ and F.H. Tschirley. 1961. "Response of Native and Introduced Grasses Following Aerial Spraying of Velvet Mesquite in Southern Arizona," Journal of Range Management. 14:155-159.

_____ and S.C. Martin. 1975. Vegetation Responses to Grazing, Rainfall, Site, Condition, and Mesquite Control on Semi-Desert Range. In: U. S. Department of Agriculture Forest Service Research Paper RM-149. Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colo.

Canfield, R.H. 1939. The Effect of Intensity and Frequency of Clipping on Density and Yield of Black Grama and Tobosa Grass. In: U. S. Department of Agriculture Technical Bulletin No. 681.

Carothers, S.W. and R.R. Johnson. 1975. Water Management Practices and Their Effects on Nongame Birds in Range Habitats. In: Proceedings of the Symposium on Management of Forest and Range Habitats for Nongame Birds. p. 210-222.

Chaves County Commission. 1973. Chaves County Comprehensive Land Use Planning and Zoning Report. Roswell, N.M. February.

Church, D.C. 1971. The Macro-Minerals (Major). In: Digestive Physiology and Nutrition of Ruminants. Nutrition Vol. II. Oregon University Book Store. Corvallis.

Cook, C.W. and C.J. Goebel. 1962. "The Association of Plant Vigor with Physical Stature and Chemical Content of Desert Plants," Ecology. 43:543-546.

Dahl, B. E., J. P. Goen, and W.E. Bean. 1977. Tobosa Use by Cattle Still Enhanced During the Second Growing Season After Prescribed Burning. In: Research Highlights 1977 Noxious Brush and Weed Control; Range and Wildlife Management Vol. 8:41. Texas Tech University, Lubbock.

Darr, G.W. and D.A. Klebenow. 1975. "Deer, Brush Control, and Livestock on the Texas Rolling Plains," Journal of Range Management. 28:115-119.

Davis, C. A., P. E., Sawyer, J. P. Griffing, and B. D. Borden. 1974. Bird Populations on a Shrub-Grassland Area, Southeastern New Mexico. In: NMSU Agricultural Experiment Station Bulletin 619.

_____ and J.P. Griffing. 1972. Nesting of the White-Necked Raven in Southeastern New Mexico. Agriculture Experiment Station Research Report 231. New Mexico State University, Las Cruces.

_____, R.C. Barkley, and W.C. Haussamen. 1975. "Scaled Quail Foods in Southeastern New Mexico," Journal of Wildlife Management. 39:496-502.

Davis, L.I. 1963. Desert (Breeding-Bird Census). Audubon Field Note 17:504.

BeBloois, Evan, Dee Green, and Henry Wylie. n.d. A Test of the Impact of Pinyon-Juniper Chaining on Archeological Sites. In: Archeological Reports. Intermountain Region, U. S. Department of Agriculture Forest Service, Ogden, Utah.

Degenhardt, W.G. and K.L. Jones. 1972. "A New *Sceloporus Graciosus*, from New Mexico and Texas." Herpetogica. 28:212-217.

_____ and A. P. Sena. 1976. Report on the Endangered Sandune (Sagebrush) Lizard, *Sceloporus arenicolous*, in Southeastern New Mexico. Unpublished Report, on file at the Bureau of Land Management's Roswell District Office.

Denzin, Norman K. 1970. The Research Act; A Theoretical Introduction To Socioeconomic Method. New York, N. Y.

Deregibus, V.A. 1977. Organic Reserves in Herbage Plants; Their Relationship to Grassland Management. Unpublished M.S. thesis. Colorado University, Ft. Collins.

Dick-Peddie, W. A. 1965. "Changing Vegetation Patterns in Southern New Mexico. New Mexico Geological Society Guidebook. 16th Field Conference. 234-235.

Dietz, H.E. 1975. Grass: The Stockman's Crop. Soil Conservation Service Special Report.

Dixon, K. L. 1959. "Ecological and Distributional Relations of Desert Scrub Birds of Western Texas," Condor. 61:397-409.

Duvendeck, J.P. 1962. "The Values of Acorns in the Diet of Michigan Deer," Journal of Range Management. 26:371-379.

Dwyer, D.D. 1972. Burning and Nitrogen Fertilization of Tobosa Grass. In: New Mexico State University Agricultural Experiment Station Bulletin. No. 595.

Dykstra, Robert R. 1968. The Cattle Town. New York, N. Y.

Eaton, B. S., T. Cebalio, D. P. Rainey, R. F. Sieck and G. C. Todd. 1974. Tebuthiuron: A New Broad Spectrum Herbicide. 1974 Meeting of Weed Science Society of America.

Eddy County Land Use Planning Committee. 1977. Eddy County Land Use Plan. Carlsbad, N.M.

Edson, E. F. and D. M. Sanderson. 1965. "Toxicity of the Herbicide 2-methoxy-3, 6-dichlorobenzoic acid (Dicamba) and 2-methoxy-3, 5, 6-trichlorobenzoic acid (Tricamba)." Food, Cosmotolgy, Toxicology. 3:299-304.

Emlen, J.T. 1972. "Size and Structure of a Wintering Avian Community in Southern Texas," Ecology. 53:317-329.

Ensign, H.R. 1957. Foods Eaten by Brown Trout in Two Southern Wisconsin Trout Steams: Mt. Vernon and Black Earth Creeks, Dane County, Wisconsin. In: Southern Area Investigation Memorandum 181. Wisconsin Department of Natural Resources, Madison.

Errington, P.L. 1934. "Vulnerability of Bobwhite Populations to Predation," Ecology. 15:110-127.

Findlay, J.S., A.H. Harris, D. E. Wilson, and C. Jones. 1975. Mammals of New Mexico. University of New Mexico Press, Albuquerque.

Fisher, C.E., C.H. Meadors, R. Behrens, E.D. Robison, P.T. Marion, and H.D. Morton. 1959. Control of Mesquite on Grazing Lands. Texas Experiment Station B-935.

Fisher, Stuart G. and Gene E. Likens. 1973. "Energy Flow in Bear Brook, New Hampshire: An Integrative Approach to Stream Ecosystem Metabolism." Ecological Monographs, V43:421-439, No. 4.

Fleming, Elvis E. and Minor S. Huffman. 1978. Roundup on the Pecos. Roswell, N. M.

Flinders, J.T., and R.M. Hansen. 1975. "Spring Population Responses of Cottontails and Jackrabbits to Cattle Grazing Shortgrass Prairie," Journal of Range Management. 28:290-293.

Frandsen, Edward, R. and Jack D. Edwards. 1978. Report on 1977 Ranch Budgets in the Little Lost-Birch Creek Grazing Environmental Statement Area. In: Bureau of Land Management Technical Report. U. S. Department of the Interior. Denver, Colo. December.

Fretwell, S.D. 1972. Populations in a Seasonal Environment. In: Monograph of Population Biology No. 5. Princeton University Press, Princeton, N.J.

FWPCA. 1968. Water Quality Criteria. In: Report of the National Technical Administration Commission to the Secretary of the Interior's Federal Water Pollution Control Administration. U. S. Department of the Interior.

Garcia, J. D. and B. D. Gontarek. 1975. "Residues of the Herbicide EL-103 in West Texas Rangeland, 14 Months After Application." Noxious Brush and Weed Control Research Highlights. Vol. 6. Texas Tech University, Lubbock.

Geohydrology Associates, Inc. 1978. Collection of Hydrologic Data, Eastside Roswell Range EIS Area, New Mexico. (Contract No. YA-512-CT7-217) Albuquerque. June.

Getzender, M. E., J. L. Herman, and B. Van Giessen. 1969. "Residues of 4-amino-3, 5, 6-trichloropicolinic acid in grass from application of Tordon herbicides." Journal of Agricultural and Food Chemicals. 17:1251-1256.

Glendening, G.E. and H.A. Paulsen, Jr. 1955. Reproduction and Establishment of Velvet Mesquite as Related to Invasion of Semidesert grassland. In: U. S. Department of Agriculture Technical Bulletin No. 1127.

Godfrey, E. Bruce. 1978. Private Adjustments To Changes In Grazing on Public Lands. Forest Service Contractor Report. U. S. Department of Agriculture, Logan, Utah.

Goodwin, J.G., Jr., and C.R. Hungerford. 1977. Habitat Use by Native Gambel's and Scaled Quail and Released Masked Bobwhite Quail in Southern Arizona. In: U. S. Department of Agriculture Forest Service Research Paper RM-197.

Griffing, J.P. and C.A. Davis. 1976 "Comparative Foods of Sympatric Scaled Quail and Mourning Doves," The Southwestern Naturalist 21:235-255.

Haas, R.H., R.E. Meyer, C.J. Scifres, and J.H. Brock. 1973. Growth and Development of Mesquite. In: Mesquite Research Monograph No. 1:10-19. 10-19.

Hamerstrom, F. 1974. Raptor Management. In: Management of Raptors. Hamerstrom, F.N. Jr., B.E. Harrell, and R.R. Olendorff, eds. Raptor Research Report No. 2, Raptor Research Foundation, Inc., Vermillion, S. D.

Hansen, Richard M. and Ilyse K. Gold. 1977. "Blacktail Prairie Dogs, Desert Cottontails and Trophic Relations on Shortgrass Range," Journal of Range Management. 30:210-214.

Haskell, Horace S. 1945. "Successional Trends on a Conservatively Grazed Desert Grassland Range." Journal of the American Society of Agronomists. 37:978-990.

Haslam, Gerald. 1978. "Introduction." Edward Abbey. Fire on the Mountain. Albuquerque, N. M.

Hastings, J. R. and R. M. Turner. 1965. The Changing Mile: An Ecological Study of Vegetation Change With Time in the Lower Mile of and Arid and Semi-arid Region. University of Arizona Press. Tucson.

Hayward, F. 1938. "Soil Temperatures During Forest Fires in the Longleaf Pine Region," Journal of Forestry. 36:478-491.

Heady, H. F. 1975. Rangeland Management. McGraw-Hill Inc. New York, New York.

Health, R. G., et al., 1970. Comparative Dietary Toxicities of Pesticides To Birds in Short-term Tests. U. S. Bureau of Sport Fish and Wildlife, Patuxent Wildlife Research Center. Unpublished data.

Heikes, E. 1967. "Relative Toxicity of Herbicides to Man." The Weeds. April, 1967.

Hendickson, G. E. and R. S. Jones. 1952. Geology and Groundwater Resources of Eddy County, New Mexico. In: U. S. Geological Survey's Groundwater Report No. 3, State Bureau of Mines and Mineral Resources, New Mexico Institute of Mining and Technology, Campus Station, Socorro, New Mexico.

Henkel, Ramon E. and Glenn V. Guguitt. 1966. "Non-Farm Work and the Social Relations of Farmers." Rural Sociology. 31;1, 80-88. February.

Hensley, M.M. 1954 "Ecological Relations of the Breeding Bird Populations of the Desert Biome in Arizona," Ecological Monographs. 24:185-207.

Herbel, C. H. 1965. Research on Improvement of Brush-Infested Grazing Land on the Jornada Experimental Range. In: Talk Given to Far West Texas Association of Soil Conservation Service. El Paso.

_____ and A. B. Nelson. 1969. Grazing Management on Semidesert Ranges in Southern New Mexico. In: Jornada Experimental Range Report No. 1.

_____, R. S. Steger and W. L. Gould. 1973. Managing Semidesert Ranges of the Southwest. In: Cooperative Extension Service Circular No. 456. New Mexico State University, Las Cruces.

Hill, F.E., R.C. Heath, J.W. Spann, and J.E. Williams. 1975. Lethal Dietary Toxicities of Environmental Pollutants to Birds. In: U. S. Fish and Wildlife Service Special Scientific Report No. 191. Washington, D.C.

Hinshaw, Gill. 1976. Lea, New Mexico's Last Frontier. Hobbs, New Mexico.

Hoffman, W. M. 1974. The Fresno Kangaroo Rat Study. In: California Department of Fish and Game Project Report W-54-R.

Hormay, August L. 1970. Principles of Rest-Rotation Grazing and Multiple Use Land Management. U. S. Department of the Interior - Bureau of Land Management and U. S. Department of Agriculture - Forest Service.

Hubbard, J.P., M.C. Conway, H. Campbell, G. Schmitt, and M.D. Hatch. 1978. Handbook of Species Endangered in New Mexico. New Mexico Department of Game and Fish, Santa Fe.

Humphrey, R. R. 1949. "Fire as a Means of Controlling Velvet Mesquite, Burroweed, and Cholla on Southern Arizona Ranges." Journal of Range Management. 2:175-182.

_____. 1952. "The Desert Grassland, Past and Present." Journal of Range Management.

_____ and L. A. Mehrhoff. 1958. "Vegetation Changes on a Southern Arizona Grassland Range." Ecology 39:720-726.

Ito, M. and S. Iizumi. 1960. Temperatures During Grassland Fires and Their Effect on Some Species in Kawatabi, Miyagi Prefecture. In: Tokyo University Scientific Reporting Research Institute D-11 (2):109-114.

Johnson, R.R. and D.A. Jones, Technical Coordinators, 1977. Importance, Preservation and Management of Riparian Habitat: A Symposium. In: U. S. Department of Agriculture Forest Service General Technical Report RM-43, Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colo.

Johnston, D.W. and E.P. Odum. 1956. "Breeding Bird Populations in Relation to Plant Succession on the Piedmont of Georgia," Ecology. 37:50-62.

Kearl, W. Gordon. 1973. Economic and Management Constraints for Livestock Production From Arid Shrublands. D. N. Hyder, ed. Arid Shrublands: Proceedingg of the Third Workshop of the United States-Australia Rangelands Panel. Denver, Colo. 116-124.

Kelley, Vincent C. 1971. Geology of the Pecos Country, Southeastern New Mexico. New Mexico Bureau of Mines and Mineral Resources. Memoir 24, 1971.

Kesler, W. J. 1957. Guide to the Fishes of New Mexico. University of New Mexico Press.

Koford, K.B. 1958. "Prairie Dogs, Whitefaces and Blue Grama." Wildlife Monograph No. 3.

Koster, W.J. 1957. Guide to the Fishes of New Mexico. University of New Mexico Press.

Kufeld, R. C., O. C. Wallmo, and C. Feddema. 1973. Foods of the Rocky Mountain Mule Deer. In: U. S. Department of Agriculture Forest Service Research Paper RM-111, July.

Lamar, Howard R. 1973. "Persistent Frontier: The West in the Twentieth Century." Western Historical Quarterly. 4:1, 4-25. February.

Lavigne, R.J, R. Kumar, J. Leetham, and V. Keith. 1972. Population Densities and Biomass of Above Ground Arthropods Under Various Grazing and Environmental Stress Treatments on the Pawnee Site, 1971. In: U. S. International Biome Program's Grassland Biome Technical Report 204.

Lea County Land Use Planning Board. 1973. Lea County Land Use Planning Report. Lovington, N.M.

Leifeste, W.F. 1971. Control of Mesquite in Southeastern New Mexico. Unpublished M.S. thesis. New Mexico State University, Las Cruces.

Lewis, E. P. and D. T. Taylor. 1977. "Impact of Public Lands Policies on the Livestock Industry and Adjacent Communities." Wyoming Agricultural Experiment Station Record-Journal. 116. Laramie.

Ligon, J.S. 1961. New Mexico Birds and Where to Find Them. University of New Mexico Press.

Lowry, O. J. 1966. Establishment, Operation, and Maintenance of Phreatophyte Control Projects. In: Vegetation Management on Floodplains and Riparian Lands: Phreatophyte Symposium, Pacific Southwest Inter-Agency Committee. 66-3. Albuquerque. August.

Lynn, G. E. 1965. "A review of Toxicological Information on Tordon Herbicide." Down to Earth 20(4):6-8.

Lynott, W.P. 1978. Climate and Dispersion Meteorology of BLM land in New Mexico. Science Applications, Inc., La Jolla, California.

Mackie, R. J. 1978. Impacts of Livestock Grazing on Wild Ungulates. 43rd North American Wildife Conference.

Mader, W. J. 1975. "Extra Adults at Harris' Hawk Nests." Condor 77:482-485.

Malina, M. 1967. Banvel: Dicamba Treated Grass. In: General Analytical Report No. 6. Velsicol Residue Project 67-4.

Maloney, Thomas J. 1966. Technological Conservatism in Cattle Ranching as an Adaptive Process. J. W. Bennett, ed. In: Proceedings of American Association for the Advancement of Science: Symposium on Social Research in North American Moisture-Deficient Regions. Las Cruces, New Mexico 63-70.

Marcy, R. B. 1849. Report of Captain R. B. Marcy. In: House Executive Document 45, 31st Congress, 1st Session, Public Document 577. Washington, D. C.

Martin, A.C., H.S. Zim, and A.L. Nelson. 1951. American Wildlife and Plants: A Guide to Wildlife Food Habits. Dover Publications, Inc., New York.

Martin, S.C. 1975. Ecology and Management of Southwestern Desert Grass-Shrub Ranges: The Status of our Knowledge. In: U. S. Department of Agriculture Forest Service, Research Paper RM-156.

_____. 1973. "Responses of Semi-Desert Grasses to Seasonal Rest," Journal of Range Management 26:165-170.

_____ and Cable, D.R. 1974. Managing Semi-Desert Grass-Shrub Ranges. In: U. S. Department of Agriculture Forest Service Technical Bulletin No. 1480.

Martin, William E. and Arthur H. Smith. 1968. The Southwestern Range Livestock Industry as a Sector of Modern Commercial Agriculture. William E. Martin, ed. In: Proceedings of the Western Agricultural Economics Research Council. Tucson, Arizona. November.

McCollister, D. D., and M. F. Long. 1969. "Toxicology of Picloram and Safety Evaluation of Tordon Herbicides." Down to Earth 25(2):5-10.

McGowan, Terry. 1976. Statement on Improving Fish and Wildife Benefits in Range Management. In: Proceedings of a Seminar, Improving Fish and Wildife Benefits in Range Management. (Washington, D.C., March 1976), U. S. Department of Interior, Fish and Wildlife Service, Biological Services Program, Washington, D.C.

Mellanby, K. 1967. Pesticides and Pollution. London, Collins.

Mengel, R.M. 1970. The North American Central Plains as an Isolating Agent in Bird Specialization, In: Pleistocene and Recent Environments of the Central Great Plains. Department of Geology, University of Kansas Special Publication No. 3. University Kansas, Lawrence.

Merril, L.B. 1954. "A Variation of Deferred Rotation Grazing for Use Under Southwest Range Conditions," Journal of Range Management 7:152-154.

Meyer, Richard F. 1966. Geology of Pennsylvanian and Wolfcampian Rocks in Southeast New Mexico. In: New Mexico Bureau of Mines and Mineral Resources, Memoir 17.

Michels, J.W. 1973. Dating Methods in Archeology. Seminar Press, New York.

Michler, N., Jr. 1850. Routes from the Western Boundary of Arkansas to Santa Fe and the Valley of the Rio Grande. In: House Executive Document 67, 31st Congress, 1st Session, Public Document 577. Washington, D. C.

Miller, R. F. and F. B. Donart. 1979. "Response of *Boutelova eriopoda* (Torr.) Torr. and *Sporobolus Flexuosos* (thrub.) Rybd. to Season of Defoliation." Journal of Range Management 32:63-66.

Montgomery, M.L. and L.A. Norris. 1970. A Preliminary Evaluation of the Hazards of 2,4,5-T in a Forest Environment. In: U. S. Department of Agriculture Forest Service Pacific Northwest Forest and Range Experiment Station Research Note. PNW-116.

Morre', J. D. 1974. Brush Control along Agricultural Drainage Ditches. Technical Report, Purdue University, Lafayette, Ind., Water Resources Research Center. Office of Water Research and Technology, Washington, D. C.

Morris, M.G. 1967. "Responses of Some Phytophagous Insects to Cessation of Grazing," Journal of Applied Ecology. 4:459-474.

Morton, D. M. and Hoffman, D. G. 1976. "Metabolism of a New Herbicide: Tebuthiuron (1(5(1.1 dimethylethy 1) 1. 3. 4. thiadiazolsyl) fish.)." Toxicology Environmental Health. 1(5):757-758.

National Cancer Institute. 1978. Bioassay of Picloram for Possible Carcinogencity. Technical Report, National Cancer Institute, Bethesda, Md.

Nelson, E.W. 1934. The Influence of Precipitation and Grazing Upon Black Grama Grass Range. In: U. S. Department of Agriculture Technical Bulletin No. 409.

Nelson, Marc and Bob Ereleth. 1978. Environmental Analysis, Mine Plan Approval, National Potash Co., Lea Mine. U.S. Geological Survey, Conservation Division, Office of the Mining Supervisor. P.O. Box 26124, Albuquerque.

Neunschwander, Leon F., Terry L. Whigham, and Henry A. Wright. 1977. Autogenic Succession Following Burning in a Tobosa-grass-Mesquite Community. In: Research Highlights of Noxious Brush and Weed Control. Range and Wildlife Management. Texas Tech. University, Lubbock.

New Mexico Employment Security Commission. 1978. Annual Planning Report: Fiscal Year 1979. Albuquerque. March.

_____. 1978. Labor Information Series B. Unpublished data printouts. Albuquerque.

New Mexico Interagency Range Committee. 1970. Control of Shinnery Oak, Mesquite, and Creosote Bush in New Mexico. Report No. 4.

New Mexico State University. 1977. Habitat Evaluation of Lesser Prairie Chickens in Eastern Chaves County, New Mexico. In: Progress Report October 1, 1975, through January 31, 1977. New Mexico State University.

Newton, M. and L.A. Norris. 1968. Herbicide Residues in Blacktail Deer from Forests Treated with 2,4,5-T and Atrazine. In: Proceedings of the Western Society of Weed Sciences 32-34.

Nicholson, J. Alexander and Alfred Clebsch, Jr. 1961. Geology and Groundwater Conditions in Southern Lea County, New Mexico. In: Groundwater Report 6, U. S. Geological Survey, State Bureau of Mines and Mineral Resources, New Mexico Institute of Mining and Technology, Campus Station, Socorro, New Mexico.

Nielsen, Darwin B. and John P. Workman. 1971. The Importance of Renewable Grazing Resources on Federal Lands in Eleven Western States. In: Utah Agricultural Experiment Station Circular 155. Logan: November.

Norris, J.J. 1950. Effects of Rodents, Rabbits and Cattle on Two Vegetation Types in Semi-Desert Rangeland. New Mexico State Agricultural Experimental Station. Las Cruces, N.M.

Norris, L. A., and M. L. Montgomery. 1975. "Dicamba Residues in Streams after Forest Spraying." Bulletin of Environmental Contamination and Toxicology. 13(1): 1-8.

Olendorff, R.R. and S.W. Stoddart, Jr. 1973. Suggested Future Research Toward Effective Raptor Management. In: The Ecology of Nesting Birds of Prey of Northeastern Colorado. U. S. International Biological Program Grassland Biome Technical Report No. 211. 163-211.

_____ and J. W. Stoddart, Jr. 1974. The Potential for Management of Raptor Populations in Western Grasslands. In: Management of Raptors. Hamerstrom, F. N., Jr., B. E. Harrell, and R. R. Olendorff, eds. Raptor Research Report No. 2, Raptor Research Foundation, Inc. Vermillion, S. D.

Pacific Southwest Interagency Committee on Factors Affecting Sediment Yield in the Pacific Southwest Area. 1968. Report of the Water Management Subcommittee.

Parsons, Jack and Michael Earney. 1978. Land and Cattle: Conversations With a New Mexico Rancher. Santa Fe.

Paulsen, H.A. 1953. "A Comparison of Surface Soil Properties Under Mesquite and Perennial Grass," Ecology. 34:727-232.

Paulsen, H.A., Jr., and Fred N. Ares. 1962. Grazing Values and Management of Black Grama and Tobosa Grasslands and Associated Shrub Ranges of the Southwest. In: U. S. Department of Agriculture Forest Service Technical Bulletin No. 1270.

Pepper, J.H. 1955. "The Ecological Approach to Management of Insect Populations," Journal of Economic Entomology. 48:451-456.

Peryam, J. Stephen and Carl E. Olson. 1975. "Impact of Potential Changes In BLM Grazing Policies on Westcentral Wyoming Cattle Ranches." Wyoming Agricultural Experiment Station Research Journal 87. Laramie.

Pettit, Russ. 1977. Sand Shinnery Oak. In: Research Highlights-1977. Noxious Brush and Weed Control: Range and Wildlife Management. Texas Tech University, Lubbock. 8:8-9.

_____ and J. B. Kauffman. 1977. Stem Growth of Hybird Oak Growing in Mottes. p. 10. In: Research Highlights-1977. Noxious Brush and Weed Control. Vol. 8. Range and Wildlife Management. Texas Tech University, Lubbock.

Phillips, P. 1936. "The Distribution of Rodents in Overgrazed and Normal Grasslands of Central Oklahoma," Ecology. 17(4):673-679.

Pieper, Rex D. and Gary B. Donart. 1978. "Response of Fourwing Salt-Bush to Periods of Protection," Journal of Range Management. 31:314-315.

Platts, W.S. 1978. Livestock Interactions with Fish and Aquatic Environments: Problems in Evaluation. 43rd North American Natural Resources Conference.

Plummer, A. Perry. 1974. Morphogenesis and Management of Woody Perennials in the United States. In: Plant Morphogenesis as the Basis for Scientific Management of Range Resources: Proceedings of the Workshop. U. S. - Australia Rangelands Panel, Berkely, Calif., 1971. Agricultural Research Service, U. S. Department of Agriculture Miscellaneous Publication 1271. 72-80.

Pratt, W.L. 1973. Reference: Letter to the BLM Concerning Distribution of Snails in New Mexico.

Quast, J. 1954. "Rodent Habitat Preference on Foothill Pastures in California," Journal of Mammalogy. 35(4):515-521.

Raitt, R.J. and R. L. Maze. 1968. "Densities and Species Composition of Breeding Birds of a Creosote Bush Community in Southern New Mexico," Condor. 70:193-205.

_____ and S.L. Pimm. 1974. Temporal Changes in Northern Chihuahuan Desert Bird Communities. In: Proceedings of the Symposium on the Biological Resources of the Chihuahuan Desert Region. U.S. and Mexico. Sul Ross State University, Alpine, Texas. October.

Reardon, P.O. and L.B. Merrill. 1976. "Vegetative Response Under Various Grazing Management Systems in the Edwards Plateau of Texas," Journal of Range Management. 29:195-198.

Renwald, J.D. 1977. Effect of Fire on Lark Sparrow Nesting Densities," Journal of Range Management. 34:283-285.

_____, H. A. Wright, J. T. Flinders. 1978. "Effects of Prescribed Fire on Bobwhite Quail Habitat in the Rolling Plains of Texas." Journal of Range Management. 31(1): 65-69.

Reynolds, H. G. and J. W. Bohning. 1956. "Effects of Burning on a Desert Grass-Shrub range in Southern Arizona." Ecology 37:769-777.

_____, and S. C. Martin. 1968. Managing Grass-Shrub Cattle Ranges in the Southwest. U. S. Department of Agriculture, Agricultural Handbook. 162.

Rodewald, Gordon E. and Don Bostwick. 1971. Goals of Range Livestock Cow-Calf Operators. In: A Paper presented to Annual Meeting of Western Agricultural Economics Association Annual Meeting. Squaw Valley, California. July.

Rosiere, R.E., R.F. Beck, and J.D. Wallace. 1975. "Cattle Diets on Semi-Desert Grassland: Botanical Composition," Journal of Range Management 28:89-93.

Rudd, R.L. and R.E. Genelly. 1956. Pesticides: Their Use And Toxicity in Relation to Wildlife. In: California Fish and Game Commission, Game Bulletin No. 7.

Ruhe, Robert V. 1967. Geomorphic Surfaces and Surficial Deposits in Southern New Mexico. In: New Mexico Bureau of Mines and Mineral Resources, Memoir 18, 1967.

Runyan, John. 1971. The Laguna Plata Site LUAS C-10-C LA-5148: A Preliminary Report. Lea County Archeological Society, Inc., Hobbs, N.M.

Russell, P. 1964. Antelope of New Mexico. New Mexico Department of Game and Fish. Santa Fe. Bulletin No. 12.

Russell, S.M., E.L. Smith, and P.J. Gould. 1972. Studies on Sonoran Birds. Desert Biome. In: U. S. International Biological Program Research Memorandum.

Sanborn. J. R. 1974. The Fate of Selected Pesticides in the Environment. National Environmental Research Center, Corvallis, Oregon, and Illinois State Natural History Survey. Urbana, Ill.

Sargent, M., O. Blazek, J. H. Elder, C. Lembi and D. J. Morre'. 1970. The Toxicity of 2, 4-D and Picloram Herbicides to Fish. In: Report JHRP-24, Joint Highway Research Project. Purdue University, Lafayette, Ind.

Schmutz, Ervin M., Freeman, B.N., and R.E. Reed. 1968. Livestock-Poisoning Plants of Arizona. University of Arizona Press, Tucson.

Science Applications, Inc. 1978. Climate and Dispersion Meteorology Of BLM Lands In New Mexico. La Jolla, California. May.

Scifres, C. J. and T. J. Allen. 1973. "Dissipation of Dicamba from Grassland Soils of Texas." Weed Science 21:393-396.

_____. 1975. Herbicides and the Range Ecosystem. Unpublished text. Range Science Department, Texas A&M University, College Station.

_____, J.H. Brock, and R.H. Hahn. 1971. "Influence of Secondary Succession on Honey Mesquite Invasion in North Texas," Journal of Range Management 24:206-210.

_____ and R.H. Haas. 1974. Vegetation Changes in a Post Oak Savannah Following Woody Plant Control. Texas Agricultural Experiment Station MP-1136.

_____, R.R. Hahn and M.G. Merkle. 1971. "Dissipation of Picloram from Vegetation of Semi-Arid Rangelands," Weed Sciences 19:329-332.

_____, H. G. McCall, R. Maxey and H. Tai. 1977. "Residual Properties of 2, 4, 5-T and Picloram in Sandy Rangeland Soils." Journal of Environmental Quality 6(1):36-42.

_____ and J. L. Mutz. 1978. "Herbaceous Vegetation Changes following Applications of Tebuthiuron for Brush Control. "Journal of Range Management 31:375-378.

Severson, K.E. and C.E. Boldt. 1978. Cattle, Wildlife, and Riparian Habitats in the Western Dakotas. In: Management and Use of Northern Plains Rangeland. Regular Rangeland Symposium, Bismark, North Dakota, Feb. 27-28, 1978. North Dakota State University Dickinson.

Shinkle, James D. 1966. Reminiscences of Roswell Pioneers. Roswell, New Mexico.

Short, H.L. 1977. "Food Habits of Mule Deer in a Semi-Desert Grass-Shrub Habitat," Journal of Range Management. 30:206-209

Shroyer, J. P., J. F. Stritzke and L. I. Croy. n.d. "Carbohydrate Levels and Control of Blackjack Oak and Winged Elm treated with Tebuthiuron and 2, 4. 5-T. "Journal of Range Management. 32:60-62.

Simpson, Peter K. 1975. "The Social Side of of the Cattle Industry." Agricultural History. 49:2, 39-50.

Smith, Arthur H. and William E. Martin. 1972. "Socioeconomic Behavior of Cattle Ranchers With Implications For Rural Community Development in the West." American Journal of Agricultural Economics. 54:2, 217-225. May.

Singleton, J.R. 1974. Waterfowl Habitat Management in Texas. In: Texas Parks, and Wildlife Department Bulletin No. 47.

Smeins, F.E., T.W. Taylor and L.B. Merrill. 1976. "Vegetation of a 25-Year Exclosure on the Edwards Plateau, Texas," Journal of Range Management. 29:24-29.

Smoliaks, S., J. F. Dormaar, and A. Johnston. 1972. "Long-Term Grazing Effects on *Stipa-Boutaloua* Prairie Soils," Journal of Range Management. 25:246-250.

Smyth, Mand and G.A. Bartholomew. 1966. "The Water-Economy of the Black-Throated Sparrow and Rock Wren," Condor. 68:447-458.

Society for Range Management. 1974. A glossary of terms used in Range Management. Denver, Colo.

Sorensen, Earl F. 1977. Water Use by Categories in New Mexico Counties and River Basins, and Irrigated and Dry Cropland Acreage in 1975. In: Technical Report 41. New Mexico State Engineer, Santa Fe.

_____ and Don H. Baker. 1973. Mineral Resources and Water Requirements for New Mexico Mineral Industries. New Mexico Bureau of Mines and Mineral Resources. Socorro, N.M.

Sosebee, R. E., C. S. Brumley and W. E. Boyd. 1977. Use of Spike to Control Mesquite. In: Research Highlights, Noxious Brush, and Weed Control. Range and Wildlife Management. Texas Tech University, Lubbock.

Southeastern New Mexico Economic Development District. 1976. Overall Economic Development Program. Roswell, N.M.

_____. 1978. Areawide Planning Report. Roswell, New Mexico, June.

Springer, P.F. 1957. Effects of Herbicides and Fungicides on Wildlife. North Carolina Pesticides Manual, North Carolina State College. 87-106.

State of New Mexico. State Engineer in Cooperation with the New Mexico Interstate Stream Commission and the U.S. Geological Survey. State Planning Office, Santa Fe.

Stebbins, R.C. 1954. Amphibians and Reptiles of Western North America. McGraw-Hill Co., New York.

_____. 1966. A Field Guide to Western Amphibians and Reptiles. Houghton Mifflin Co., Boston.

Stevens, L., B.T. Brown, J.M. Simpson, and R.R. Johnson. 1977. The Importance of Riparian Habitat to Migrating Birds. In: Importance, Preservation, and Management of Riparian Habitat: A Symposium, U. S. Forest Service Technical Report RM-43. 156-164.

Stewart, R. E. and H. Gratkowski. 1976. Aerial Application Equipment for Herbicidal Drift Reduction. In: U. S. Forest Service Technical Report, PNW-54. Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.

Stoddart, L. A., A. D. Smith and T. W. Box. 1955. Range Management. McGraw-Hill Inc.

Summers, C.A. and Raymond L. Linder. 1976. "Food Habits of the Black-Tailed Prairie Dog in Western South Dakota," Journal of Range Management. 31:134-136.

Sureste Resource Conservation and Development Project. 1975. Program of Action. Roswell, N.M. December.

Terwillinger, C. 1953. "Antelope: A Range Asset," Colorado Conservation 2:24-25.

Texas Tech University. 1977. Research Highlights: Noxious Brush and Weed Control: Range and Wildlife Management. Lubbock.

Theis, C. V. 1937. Amount of Groundwater Recharge in the Southern High Plains, American Geophysical Union Transactions, 18th Annual Meeting. 564-568.

Tiedemann, A.R. and J.O. Klemmedson. 1973. Nutrient Availability in Desert Grassland Soils Under Mesquite *Prosopis juliflora* Trees and Adjacent Open Areas. In: Soil Science Society of America Proceedings 37:107-111.

Todd. G. C., W. R. Gibson and C. C. Kehr. 1974. "Oral Toxicity of Tebuthiuron (1(5 tert butyl 1, 3, 4 thiodiazol syl)1, 3 dimethylurea) In experimental Animals." Food, Cosmetology and Toxicology England. 12(4):461-470.

Townsend, J.E., and R.J. Smith. 1977. Proceedings of a Seminar: Improving Fish and Wildlife Benefits in Range Management. Washington D.C., March 1976. U. S. Department of the Interior Fish and Wildlife Service, Biological Service Program, Washington, D.C.

Tucker, R.K, and D.G. Crabtree. 1970. Handbook of Toxicity of Pesticides to Wildlife. In: U. S. Department of the Interior Fish and Wildlife Service Research Publication No. 84.

U. S. Department of Agriculture. Economic Research Service. Farm Economics Division. n.d. Economic Relationship of Grazing Fees and Permitted Use of Public Rangelands to Net Income of Western Livestock Ranches: A Regional Analysis. GPO 931614. Washington, D. C.

_____. 1978. "Pesticides and Honeybees." U. S. Department of Agriculture Leaflet #563, November 1977-Revised.

_____. Soil Conservation Service. 1971. Soil Survey of Bureau of Land Management Lands, Chaves County, Northern Part. Roswell, N. M.

_____. 1974. Soil Survey of Chaves County, Southern Part, New Mexico. Roswell, N. M.

_____. 1974. Soil Survey, Lea County, New Mexico.

_____. Forest Service. 1978. Vegetation Management with Herbicides, Final Environmental Statement. Pacific Northwest Region, U. S. Department of Agriculture. Vol. 1.

U. S. Department of Commerce. Bureau of Census. 1972. New Mexico: General Population Characteristics. 1970 Census of Population. Washington, D. C.

_____. 1977. New Mexico. 1974 Census of Agriculture. Washington, D. C.

U. S. Department of the Interior - Bureau of Land Management. 1973. Draft Environmental Impact Statement. Mesquite Spraying. Roswell, N. M.

_____. 1973. Habitat Management for Endangered Species Report No. 6. San Joaquin Kit Fox, related subspecies, and the Swift Fox. In: Bureau of Land Management Technical Note, Denver Service Center, Colo.

_____. 1973. Unpublished Data on Acreages and Types of Chemical Treatment in the Roswell District.

_____. 1973. Habitat Management for Endangered Species: Report No. 6 San Joaquin Kit Fox, Related Subspecies, and the Swift Fox. In: Bureau of Land Management Technical Note. Denver Service Center, Denver, Colo.

_____. New Mexico State Office. 1975. Environmental Analysis Record, Potash Leasing in Southeastern New Mexico. Santa Fe.

_____. 1978. Draft Environmental Statement: Vegetation Management with Herbicides, Western Oregon.

_____. 1965. Mineral and Water Resources of New Mexico. U. S. Government Printing Office. Washington, D. C.

Valentine, John F. 1971. Range Development and Improvements. Brigham Young University Press., Provo, Utah.

Valentine, K. A. 1970. Influence of Grazing Intensity on Improvement of Deteriorated Black Grama Range. In: New Mexico State University Agricultural Experiment Station Bulletin No. 553.

_____ and J. B Gerard. 1968. Life-History Characteristics of the Creosotebush, *Larrea Tridentata*. In: New Mexico State University Agricultural Experiment Station Bulletin No. 526.

Vanvig, Andrew. 1975. Financing Livestock Operations. In: A paper presented to the Annual Meeting of Wyoming Stockgrowers' Association's Agricultural Financing Panel. Casper. June.

Velsicol Chemical Corporation. 1971. Banvel Herbicides for Brush and Broadleaf Weed Control. Velsicol Chemical Corporation.

_____. 1972. Banvel (dicamba) Herbicide: More Grazing Per Acre. Chicago, Ill.

Vorhies, C. T., and W. P. Taylor. 1933. The Life Histories and Ecology of Jackrabbits *Lepus alleni* and *Lepus Californicus* In Relation to Grazing in Arizona. University of Arizona. Agricultural Experiment Station Technical Bulletin 49:471-587.

Wagner, F. H. 1978. Effects of Livestock Grazing and the Livestock Industry. In: Wildlife and America. Council on Environmental Quality, Washington, D. C. Reprint.

Watts, J.G. 1965. *Chirothrips Falusus* on Black Grama Grass. Agricultural Experiment Station Bulletin No. 499. New Mexico State University

Weatherill, R.G., and L.B. Keith. 1969. The Effects of Livestock Grazing on an Aspen Forest Community. Alberta Department of Lands and Forests. Fish and Wildlife Division, Technical Bulletin No. 1.

Wedel, W. R. 1957. The Central North American Grassland: Man-made or Natural? In: Social Science Monograph, III. Anthropological Society. Washington. 39-69.

Weimer, J. D. T. A. Ballard, W. U. Thomace, T. L. Hess, J. S. Olson, R. T. Markey, H. E. Morcock, A. C. Reik, E. J. Owens, and B. P. McNamara. 1957. Toxicological Studies related to the use of white (tordon 101) as a defoliant. U. S. Army Edgewood Arsenal Pharmacology Laboratory (Draft, September, 1967).

West, S. 1975. An Annotated Checklist of Amphibians, Reptiles, Birds, and Mammals of the Lake McMillan Area, Eddy County, New Mexico. Division of River Basin Studies. U.S. Department of Interior. U.S. Fish and Wildlife Service. Albuquerque.

_____. 1975. A Report to the Regional Supervisor, U. S. Fish and Wildlife Service on the Wildlife of the Lake McMillan Area.

Whitfield, C. J. and E. L. Beuter. 1938. "Natural Vegetation in Desert Plains Grassland." Ecology 19:1;26-37.

Whitman, W.C. 1971. Influence of Grazing on the Microclimate of Mixed Grass Prairie. In: U. S. Department of Agriculture Miscellaneous Publication No. 1271. 207-218.

Wiens, J.A. 1974. "Climatic Instability and the Ecological Saturation of Bird Communities in North American Grasslands," Condor. 76:385-400.

_____ and M. I. Dyer. 1975. Rangeland Avifaunas: Their Composition Energetics and Role in the Ecosystem. In: Proceedings of the Symposium on the Management of Forest and Range Habitat for Nongame Birds. U. S. Department of Agriculture U. S. Forest Service GTR, WO-1. 146-182.

Wolfe, H.G. 1977. An Environmental Baseline Study of the Los Medanos Waste Isolation Pilot Plant (WIPP) Project Area of New Mexico: A Progress Report. Sandia Laboratories, Albuquerque.

Wood, J.E. 1969. Rodent Populations and Their Impacts on Desert Rangelands. Agricultural Experiment Station Bulletin 555. New Mexico State University. Las Cruces.

Woodmansee, R.G. and L.D. Potter. 1970. "Vegetative Reproduction of Fourwing Saltbush in New Mexico," Journal of Range Management 23:371.

Wright, H.A. 1972. Fire as a Tool to Manage Tobosa Grasslands. Proceedings of the Tall Timbers Fire Ecological Conference 12:153-167.

_____. 1974. "Range Burning," Journal of Range Management. 27:5-11.

_____. 1975. Fire Ecology Course. Department of Range and Wildlife Management. Texas Tech University, Lubbock.

WSA. 1967. Herbicide handbook of the Weed Society of America. Humphrey Press, Inc. Geneva, New York.

Yoakum, J. D. 1975. "Antelope and Livestock on Rangelands." Journal of Animal Science. 40(5):985-991.

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UNITED STATES DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT
ROSWELL DISTRICT OFFICE, ROSWELL, NEW MEXICO
ROSWELL ENVIRONMENTAL STATEMENT AREA

VISUAL A
LAND STATUS
LEGEND

🟨 BLM-Administered Public Lands
🟦 State Lands
☐ Private Lands

Scale: ¼ inch = 1 mile approx.

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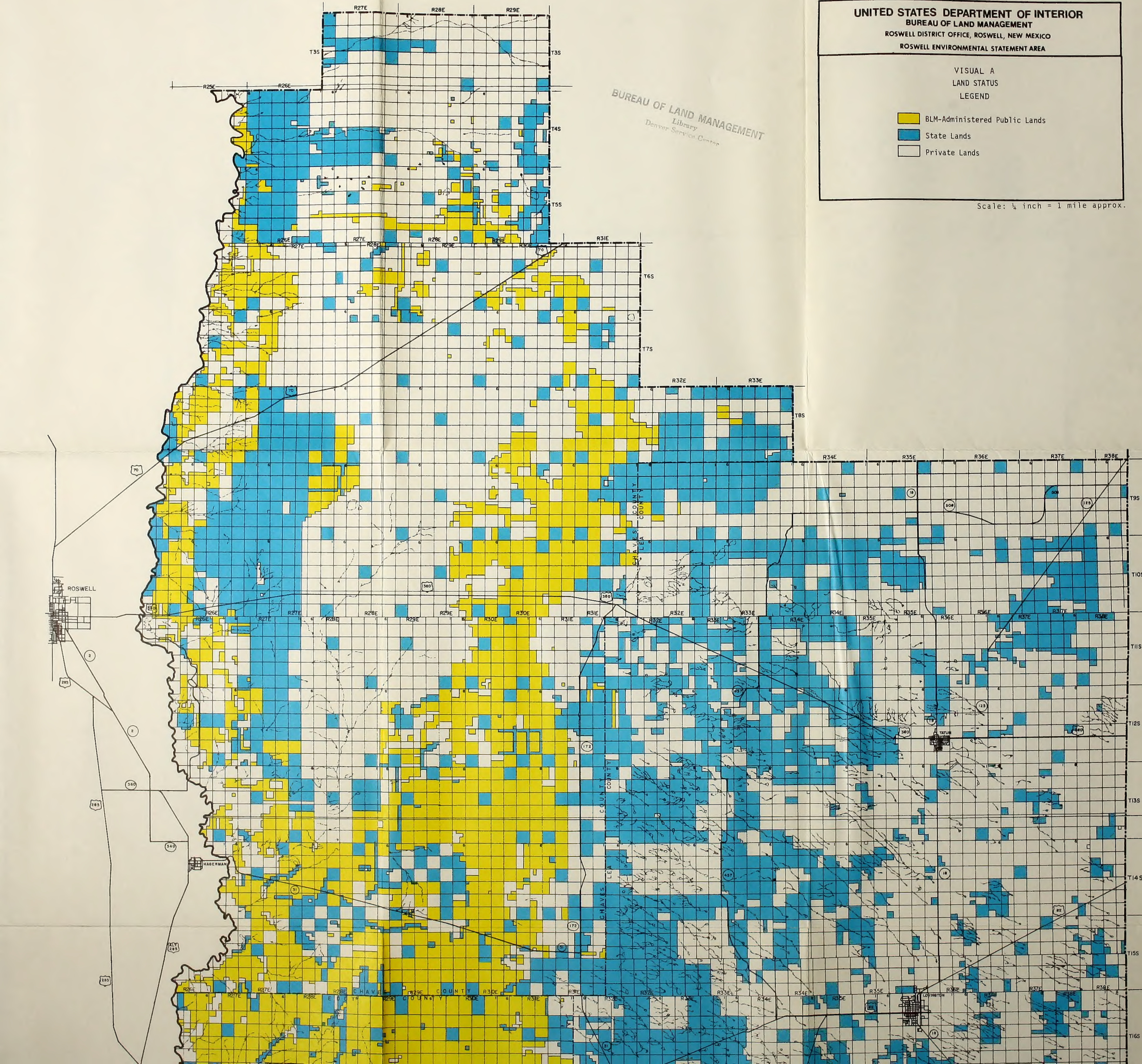

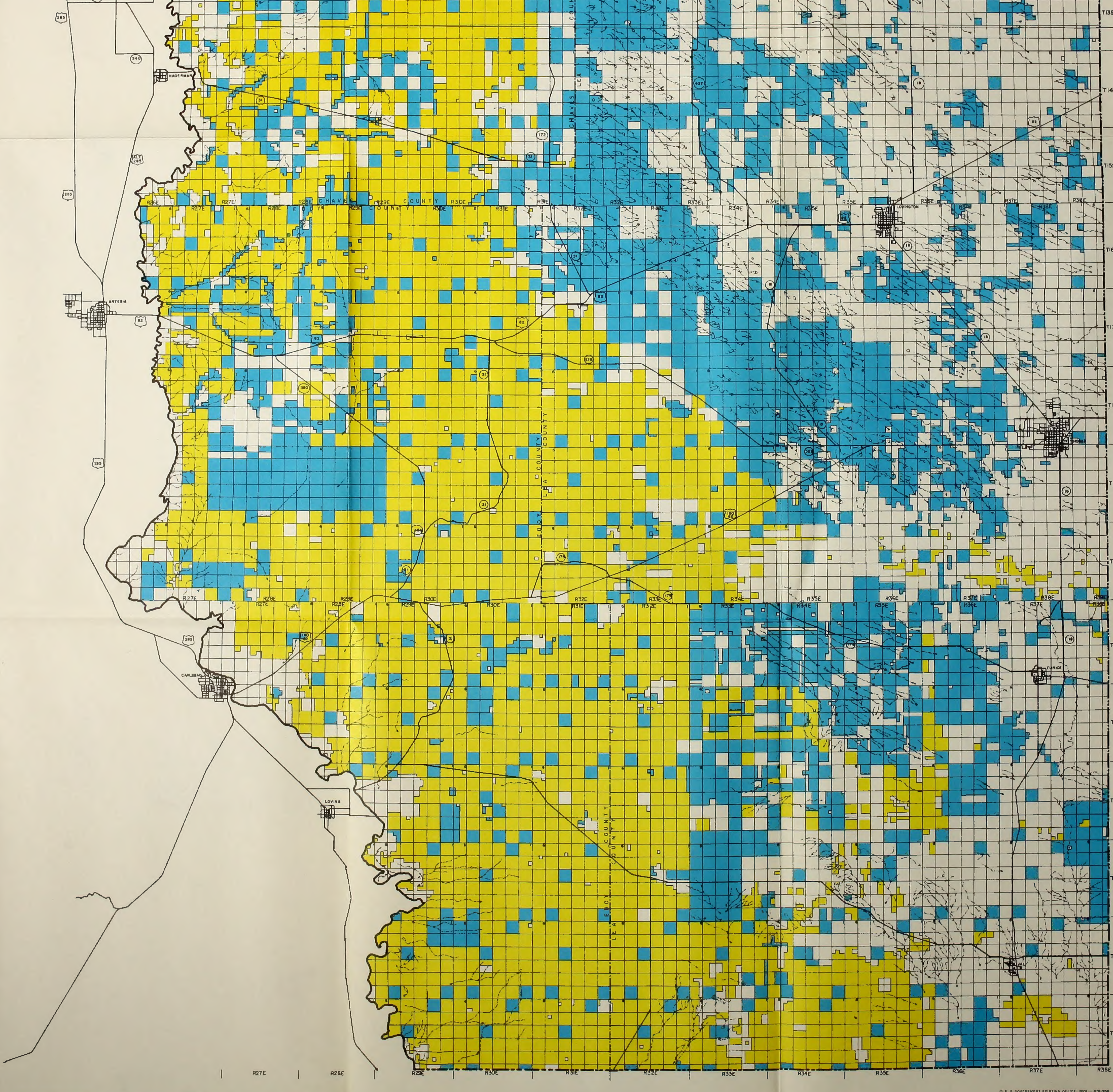

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UNITED STATES DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT
ROSWELL DISTRICT OFFICE, ROSWELL, NEW MEXICO

ROSWELL ENVIRONMENTAL STATEMENT AREA

VISUAL B
PROPOSED MANAGEMENT LEVEL
LEGEND

- ▨ Allotments With AMPs
- ▨ Allotments With Proposed AMPs
- ◂ ▦ Nonintensive Management
- ■ Unallotted Parcel
- 5099 Allotment Numbers
- — Allotment Boundaries

Scale: ¼ inch = 1 mile approx.

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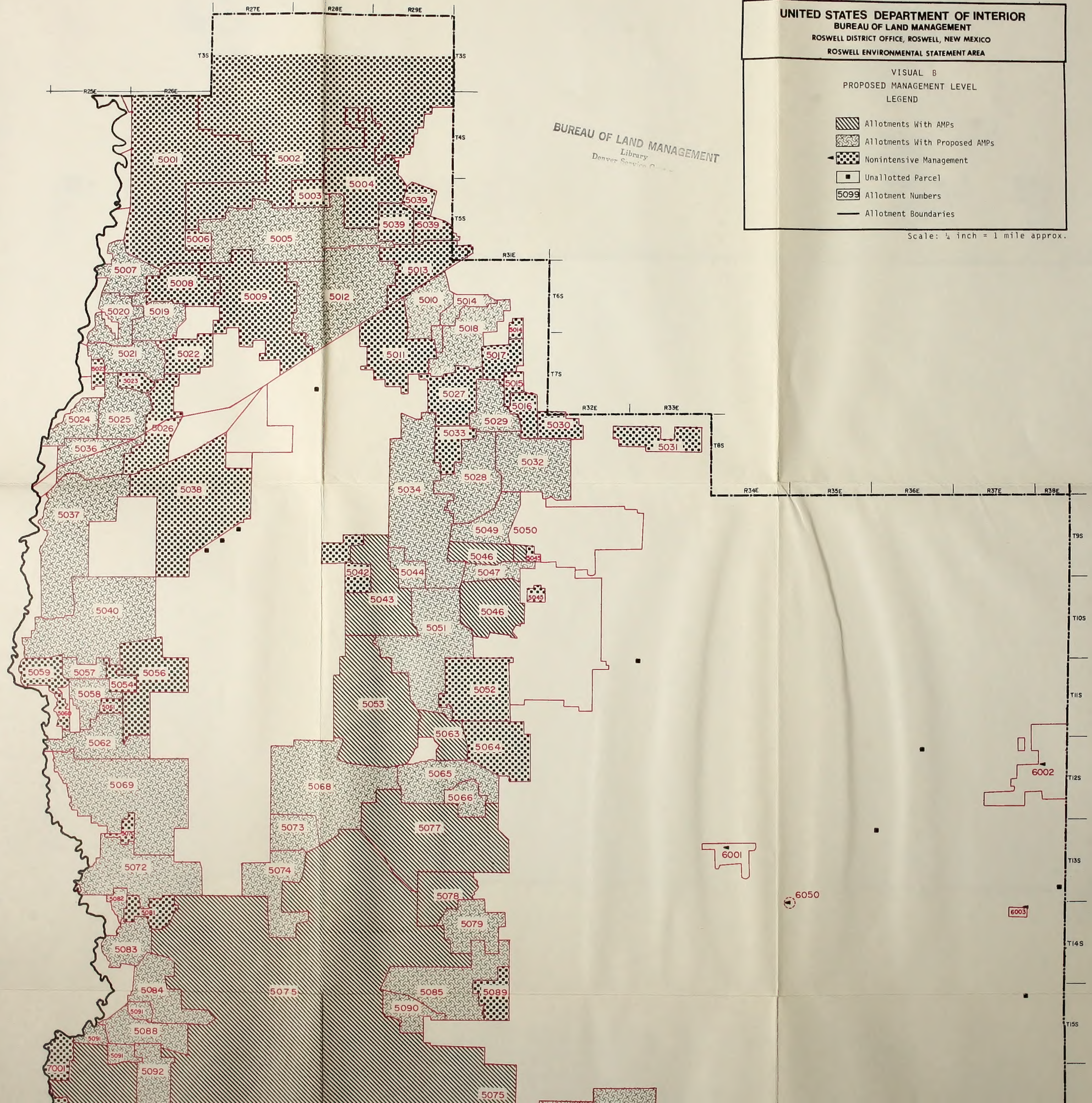

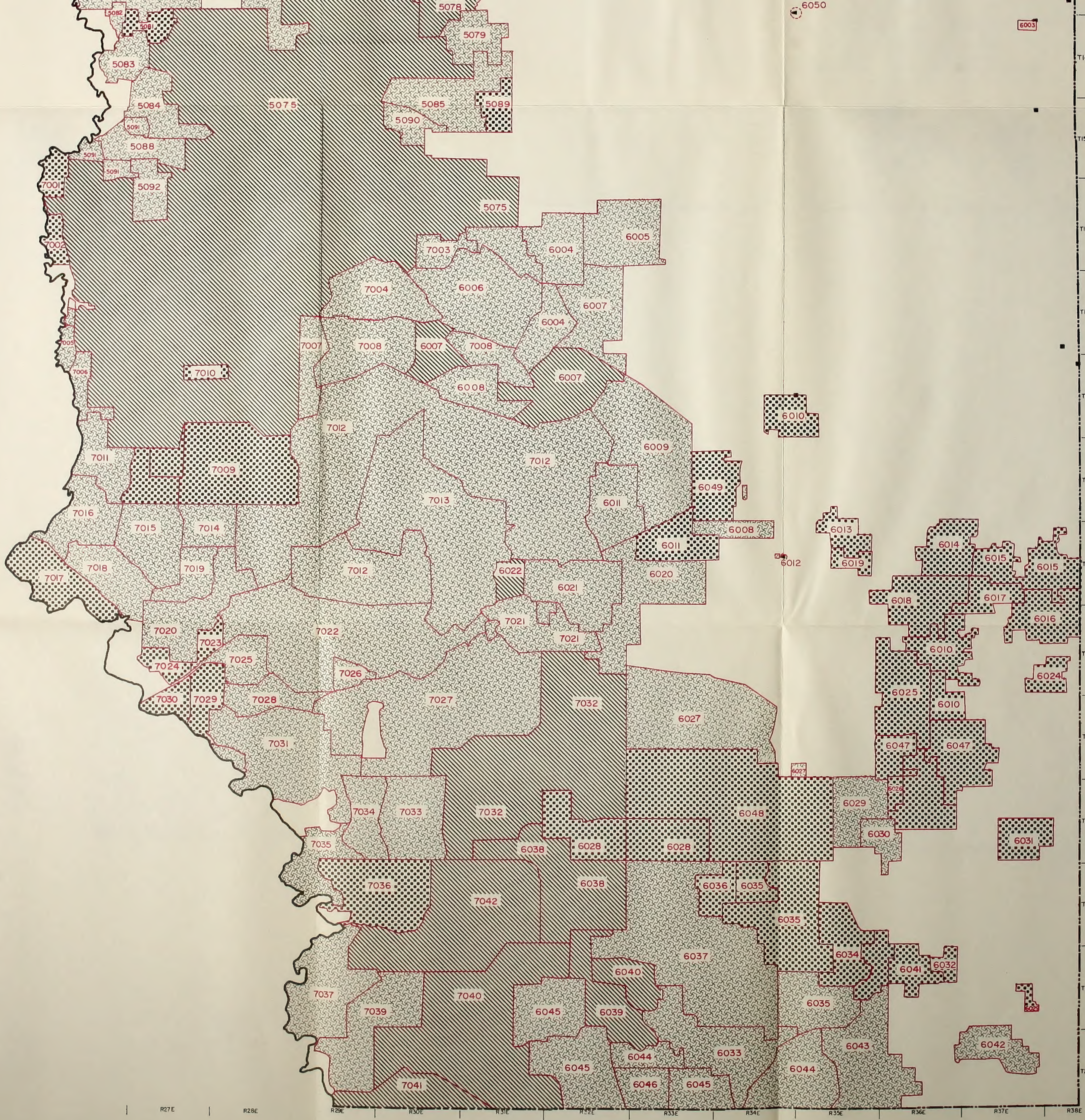

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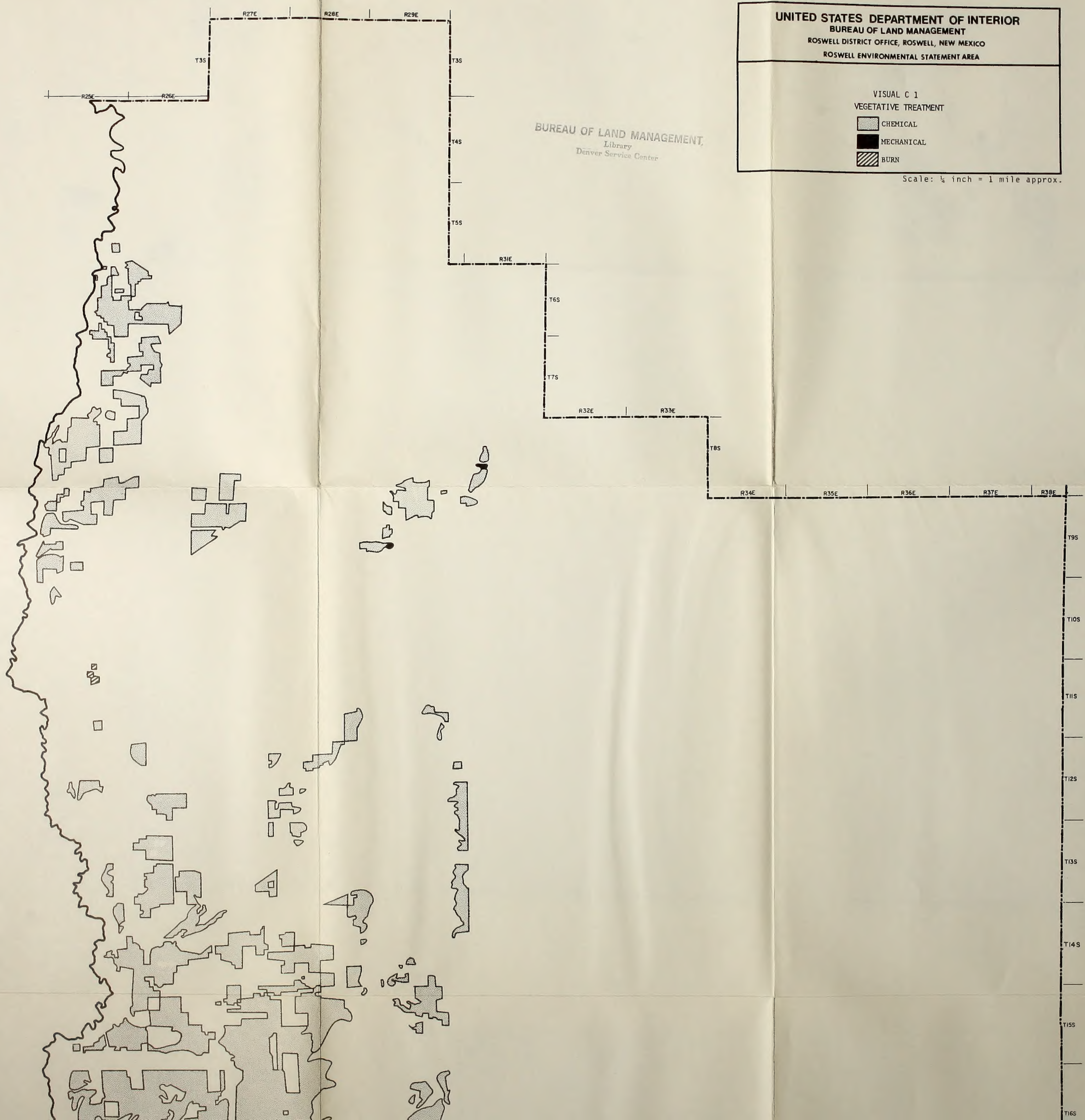

UNITED STATES DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT
ROSWELL DISTRICT OFFICE, ROSWELL, NEW MEXICO
ROSWELL ENVIRONMENTAL STATEMENT AREA

VISUAL C 1
VEGETATIVE TREATMENT

- ░ CHEMICAL
- ■ MECHANICAL
- ▨ BURN

Scale: ¼ inch = 1 mile approx.

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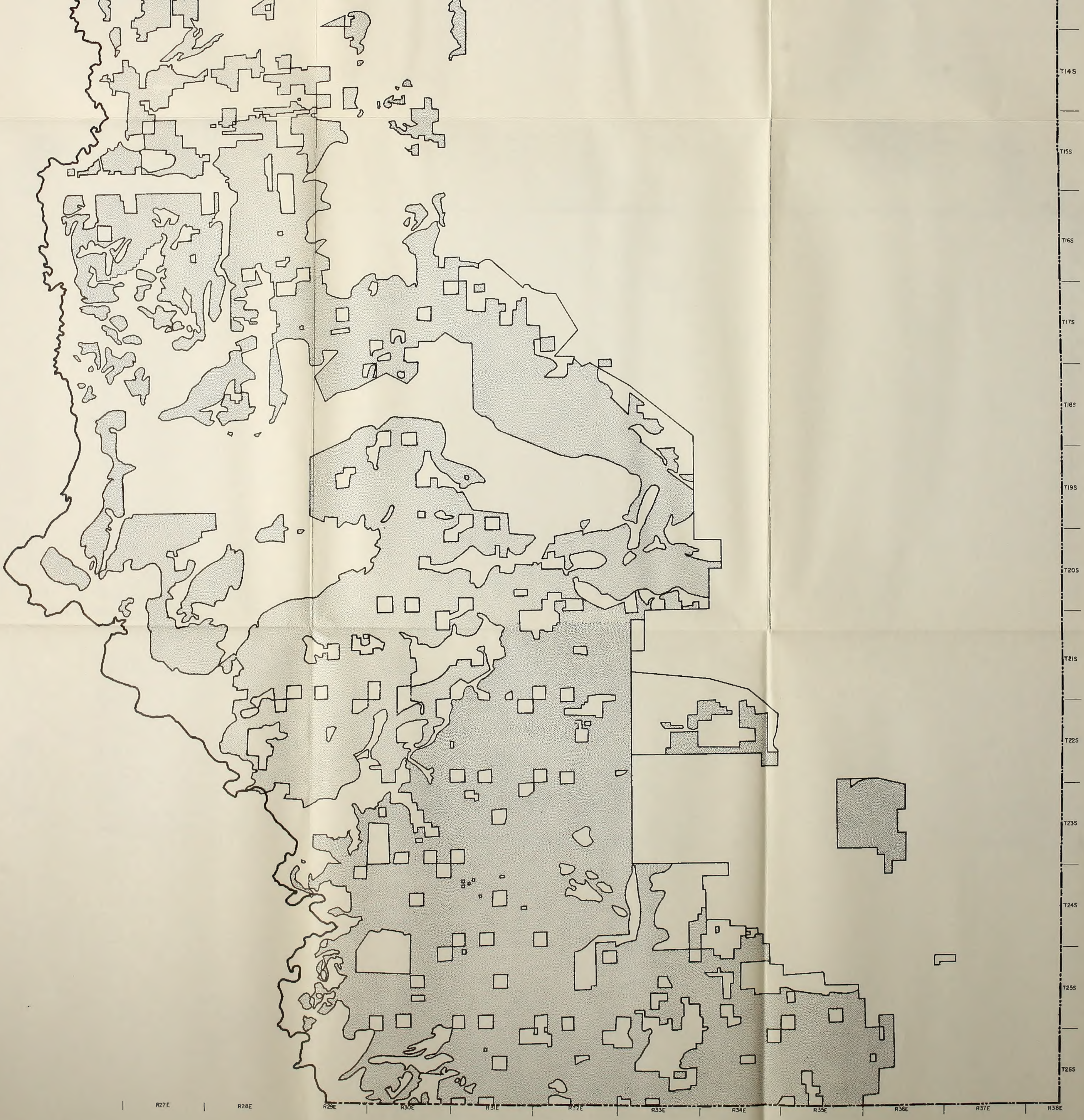

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BUREAU OF LAND MANAGEMENT
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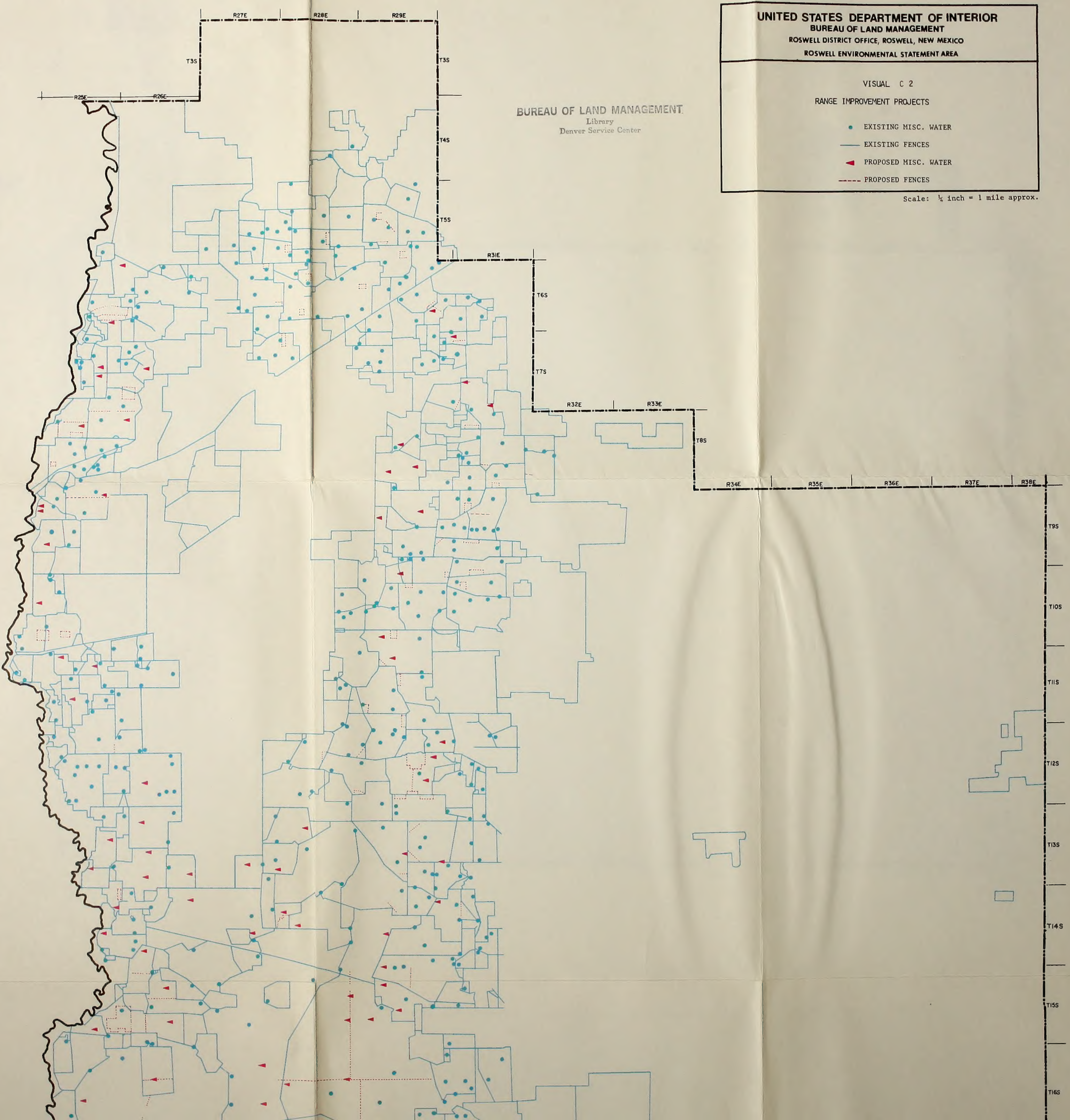
ROSWELL ENVIRONMENTAL STATEMENT AREA

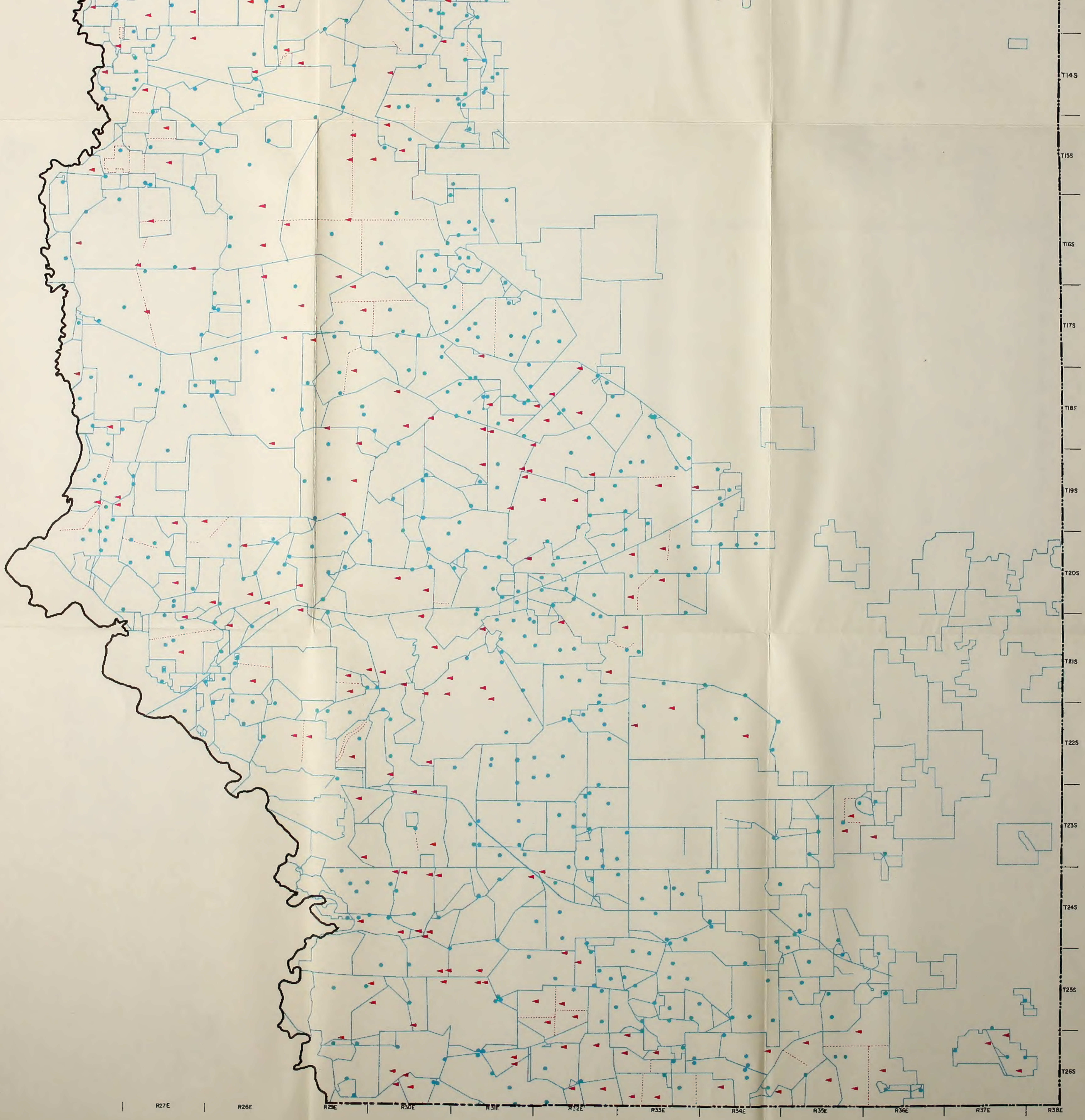
VISUAL C 2

RANGE IMPROVEMENT PROJECTS

- ● EXISTING MISC. WATER
- —— EXISTING FENCES
- ◀ PROPOSED MISC. WATER
- ----- PROPOSED FENCES

Scale: ½ inch = 1 mile approx.





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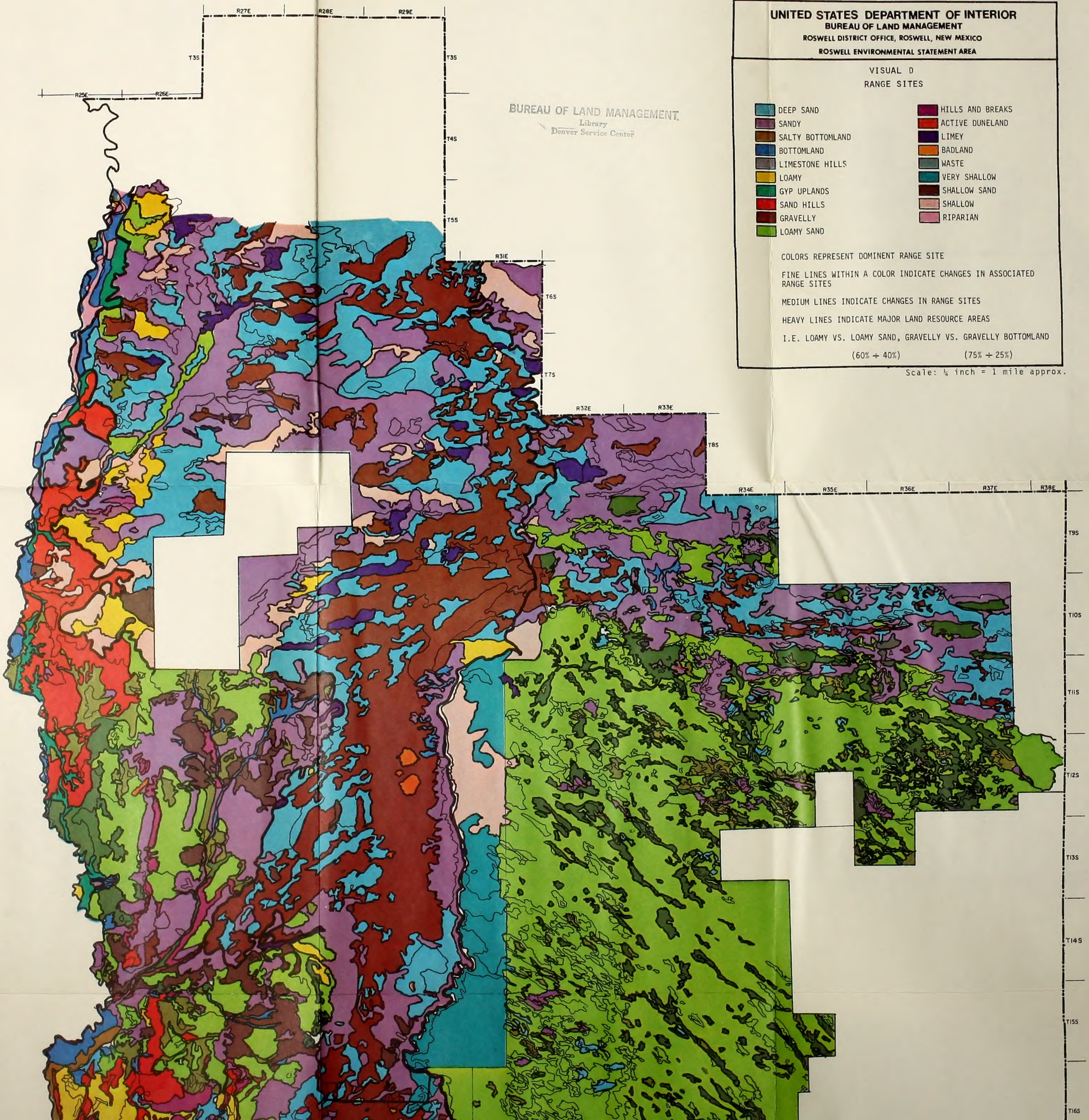
UNITED STATES DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT
ROSWELL DISTRICT OFFICE, ROSWELL, NEW MEXICO
ROSWELL ENVIRONMENTAL STATEMENT AREA

VISUAL D
RANGE SITES



- 🟦 DEEP SAND
- 🟪 SANDY
- 🟫 SALTY BOTTOMLAND
- 🟦 BOTTOMLAND
- ⬛ LIMESTONE HILLS
- 🟨 LOAMY
- 🟩 GYP UPLANDS
- 🟥 SAND HILLS
- 🟫 GRAVELLY
- 🟩 LOAMY SAND
- 🟥 HILLS AND BREAKS
- 🟥 ACTIVE DUNELAND
- 🟪 LIMEY
- 🟧 BADLAND
- ⬛ WASTE
- 🟦 VERY SHALLOW
- 🟫 SHALLOW SAND
- ⬜ SHALLOW
- ⬜ RIPARIAN

COLORS REPRESENT DOMINENT RANGE SITE

FINE LINES WITHIN A COLOR INDICATE CHANGES IN ASSOCIATED RANGE SITES

MEDIUM LINES INDICATE CHANGES IN RANGE SITES

HEAVY LINES INDICATE MAJOR LAND RESOURCE AREAS

I.E. LOAMY VS. LOAMY SAND, GRAVELLY VS. GRAVELLY BOTTOMLAND
(60% ÷ 40%) (75% ÷ 25%)

Scale: ¼ inch = 1 mile approx.

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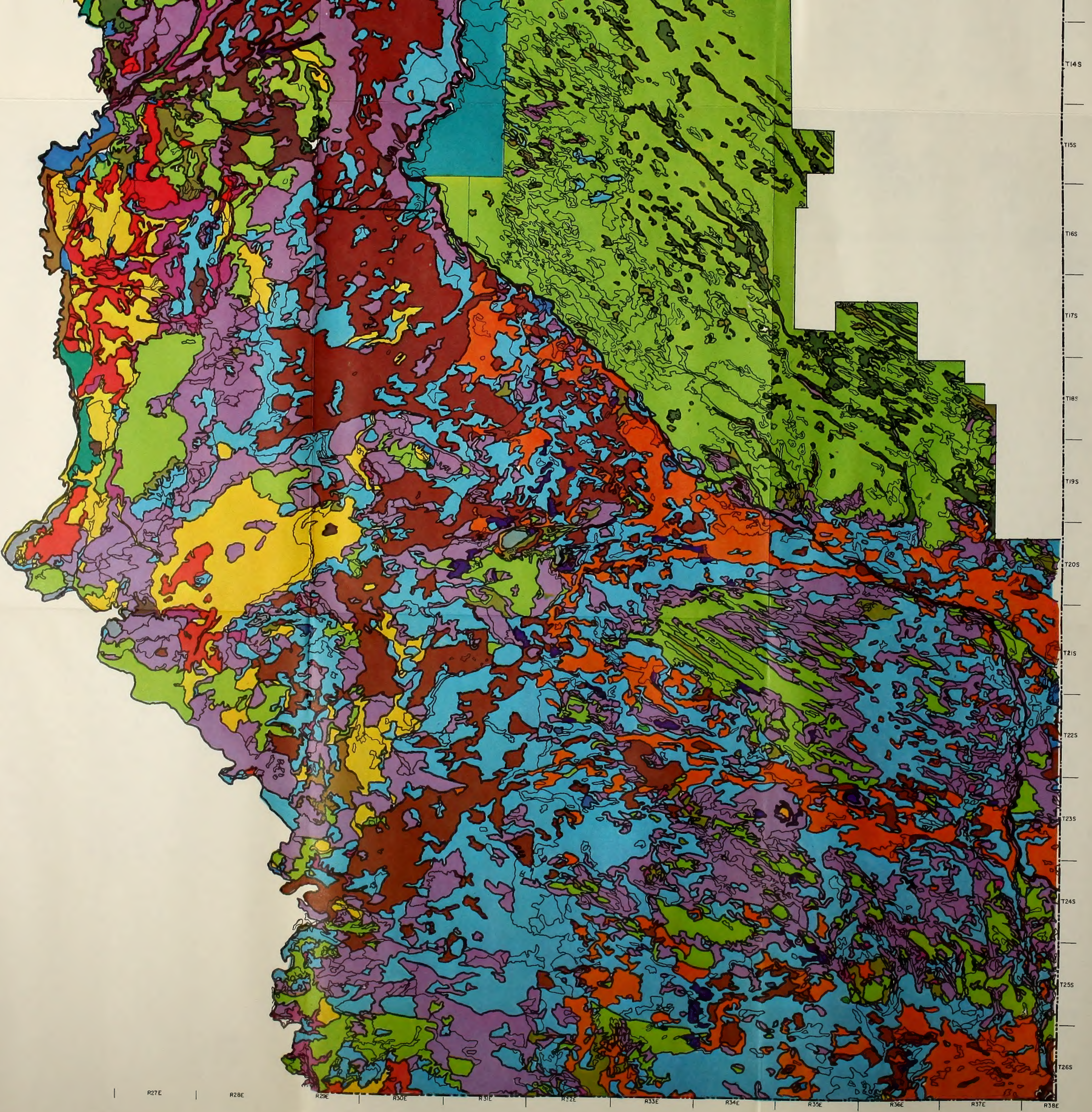

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UNITED STATES DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT
ROSWELL DISTRICT OFFICE, ROSWELL, NEW MEXICO
ROSWELL ENVIRONMENTAL STATEMENT AREA

VISUAL E
VEGETATIVE ASPECTS
LEGEND

- 🟫 Grassland
- 🟩 Mesquite, Mesquite Grassland, Hard Mesquite, Hummocky Mesquite
- 🟩 Dune Mesquite
- 🟨 Shinnery Oak, Shinnery With Mesquite, Mesquite With Shinnery
- ▨ Creosote, Creosote Mesquite, Creosote With White Thorn Acacia
- 🟦 Sand, Shifting Dunes
- 🟥 Javelina
- 🟫 Riparian
- 🟥 Grassland, Tobosa Flat, Snakeweed Grassland, Cholla Grassland, Desert Grassland
- 🟧 Sacraton
- 🟫 Gyp Grassland
- 🟪 Waste
- 🟦 Other Desert Shrub, Mixed Desert Shrub
- 🟪 Acacia, Catclaw Acacia, Catclaw, Acacia Desert Shrub

Scale: ¼ inch = 1 mile approx.

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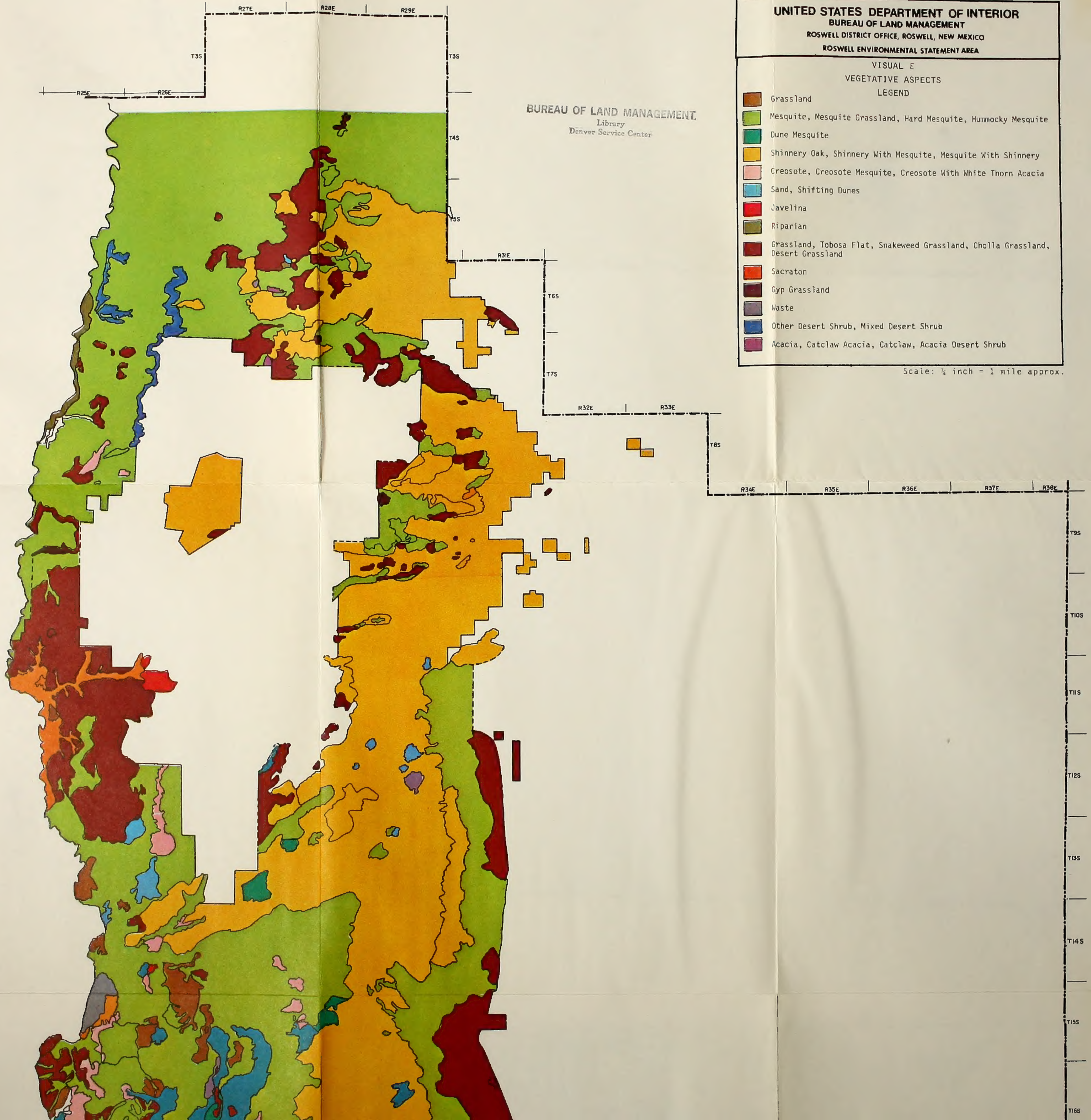

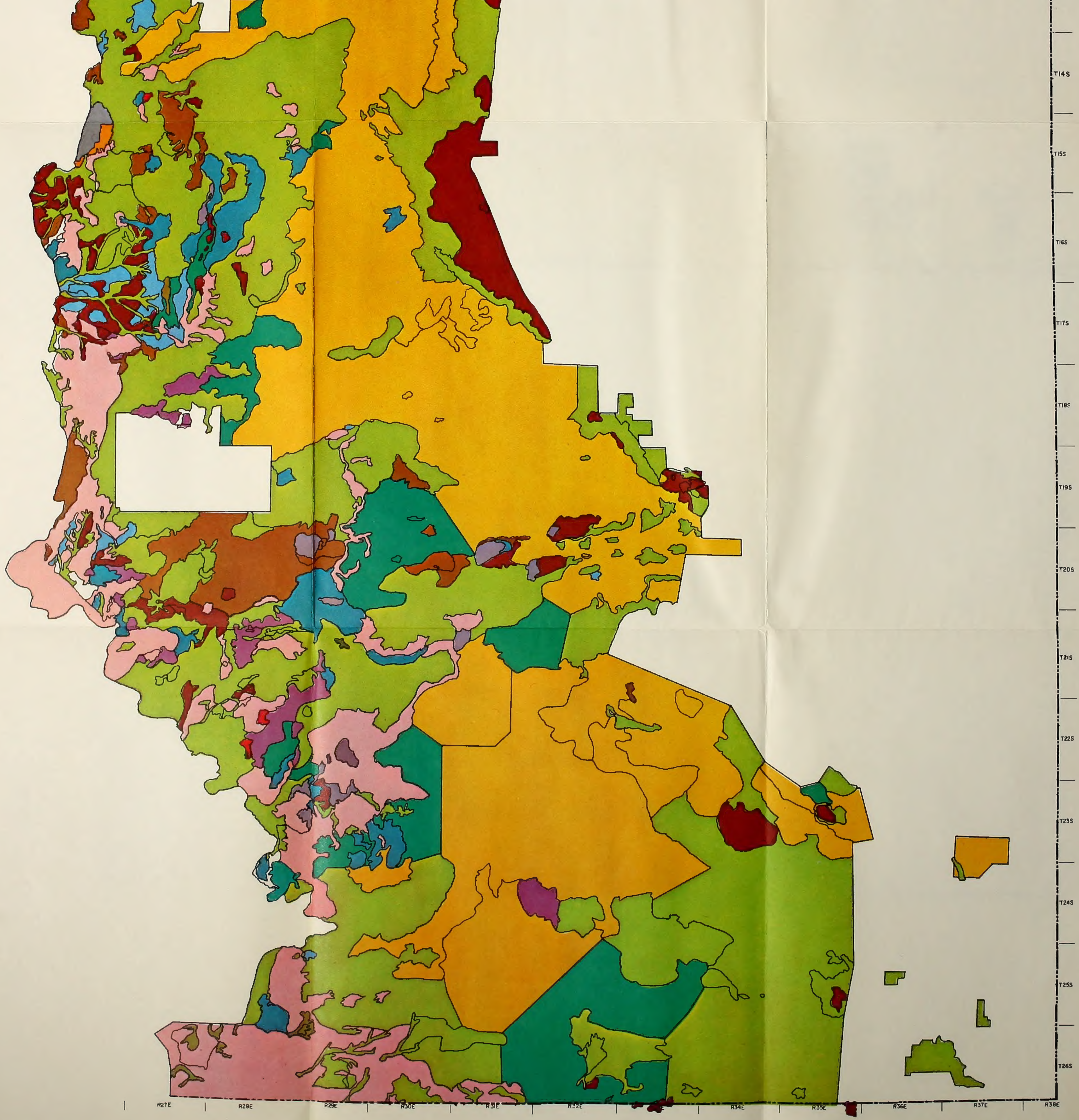

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Form 1279-3
(June 1984)

BORROWER'S CARD

SF 85.35 .N6 E22 1979b
Final environmental
statement on grazing

DATE LOANED
BORROWER

USDI - BLM